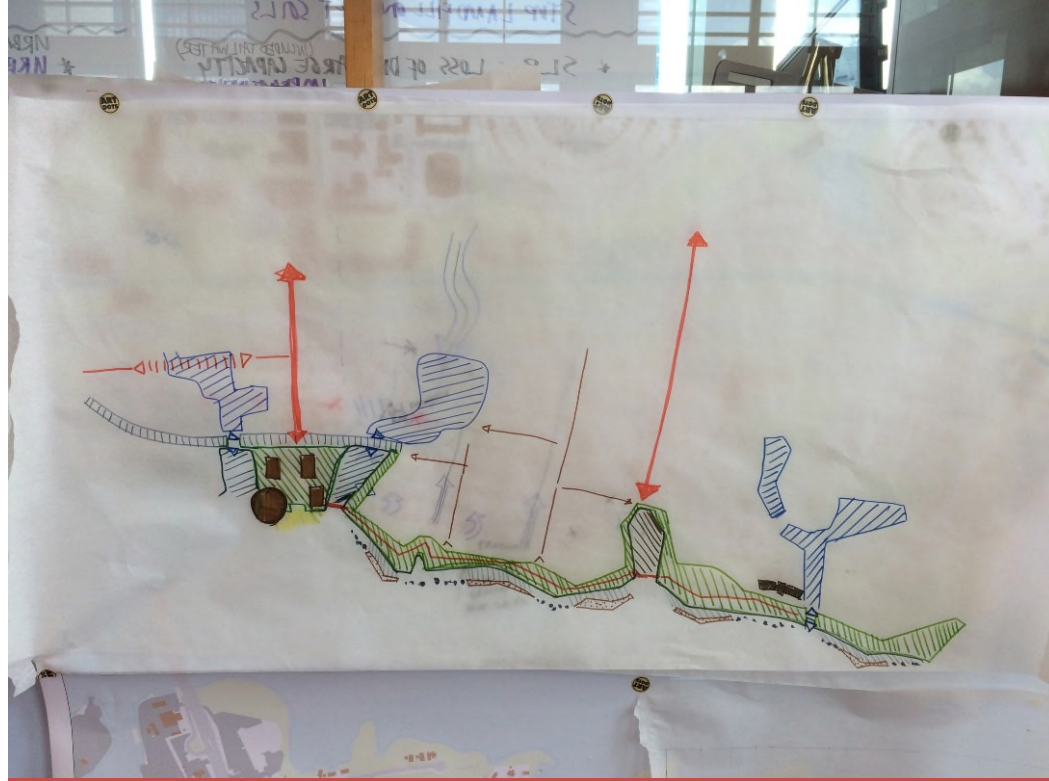


*Climate change “poses immediate risks to US national security...
Politics or ideology must not get in the way of sound planning.”*

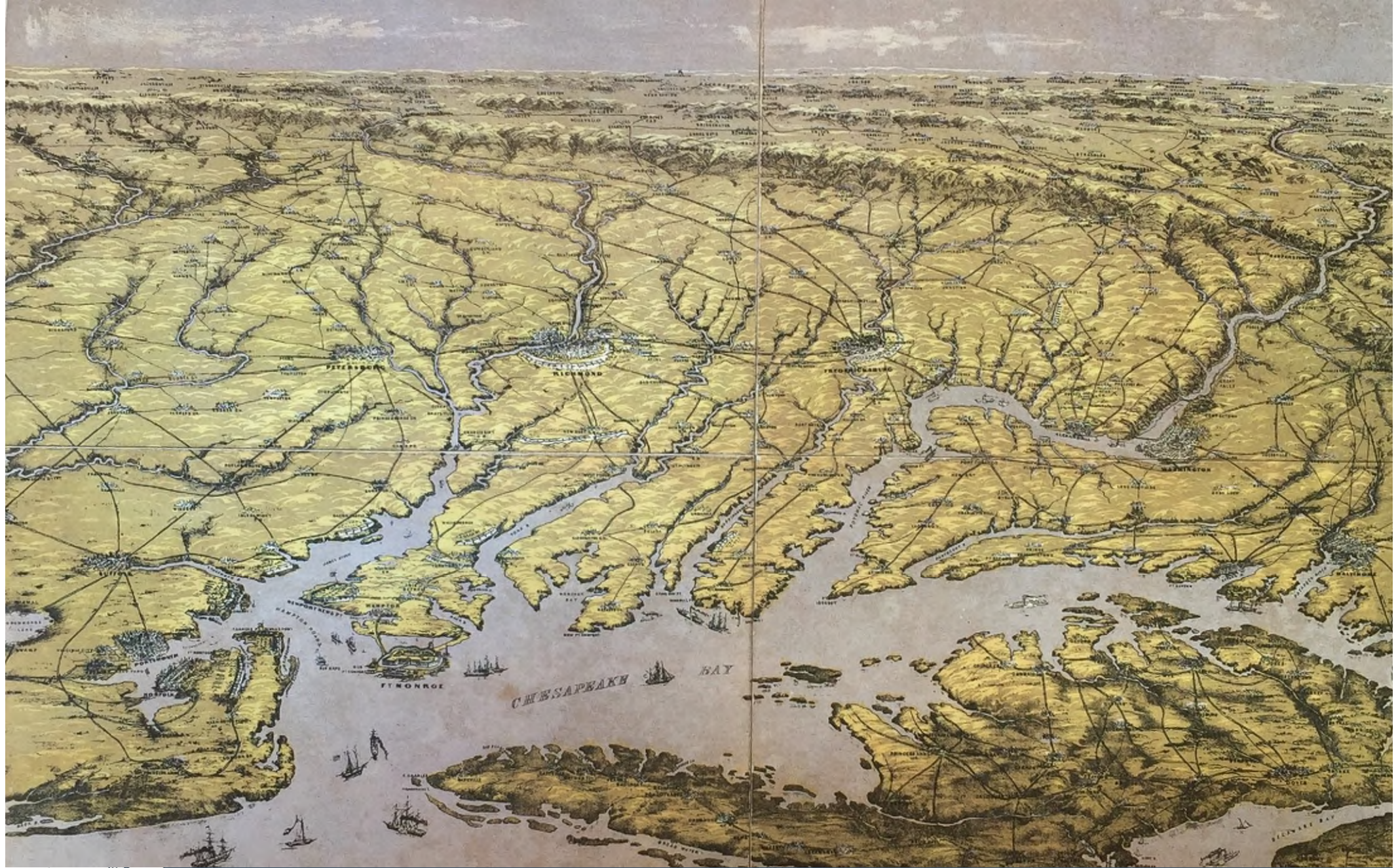
US Sec of Defense Chuck Hagel, Oct 2014





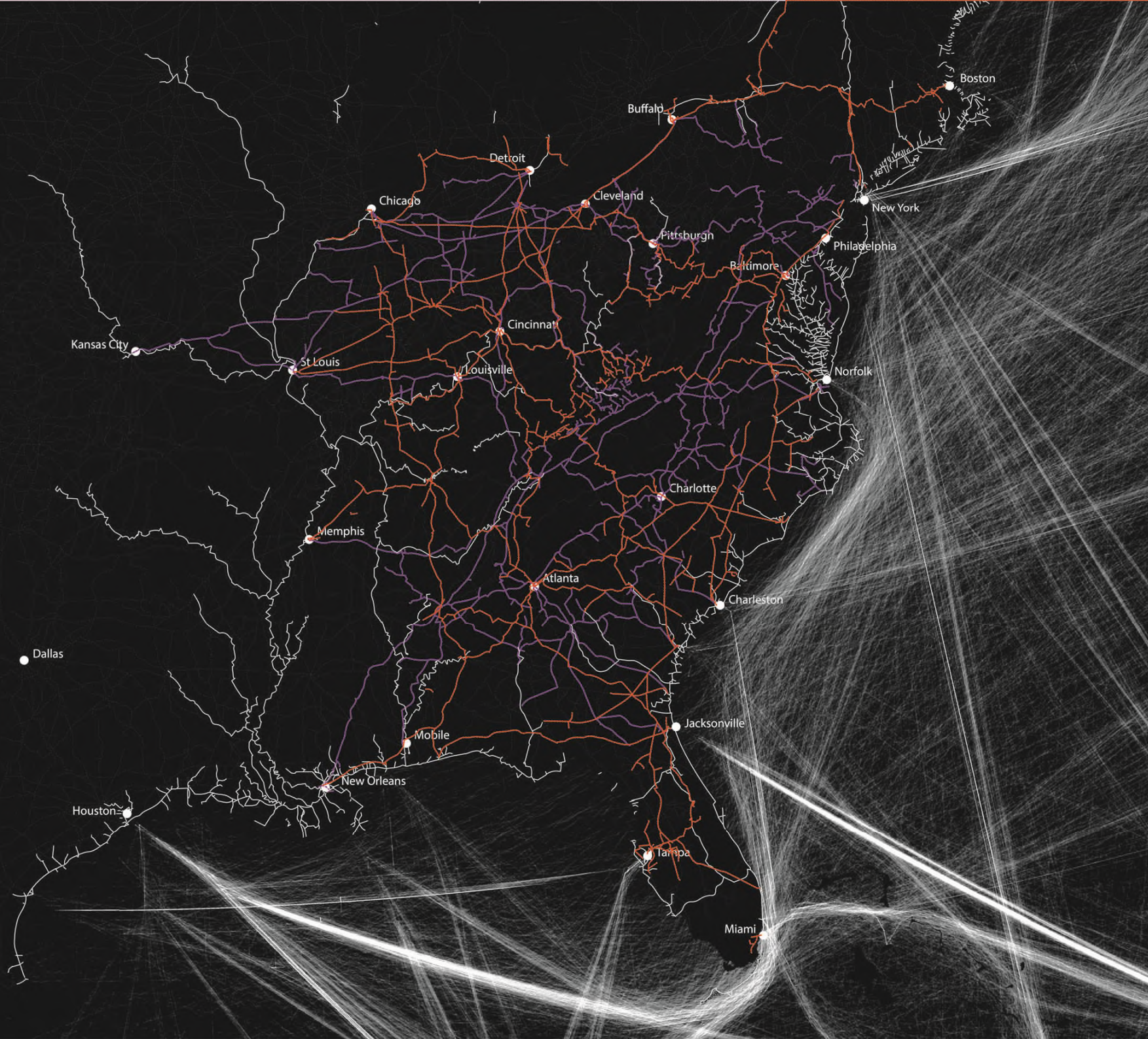


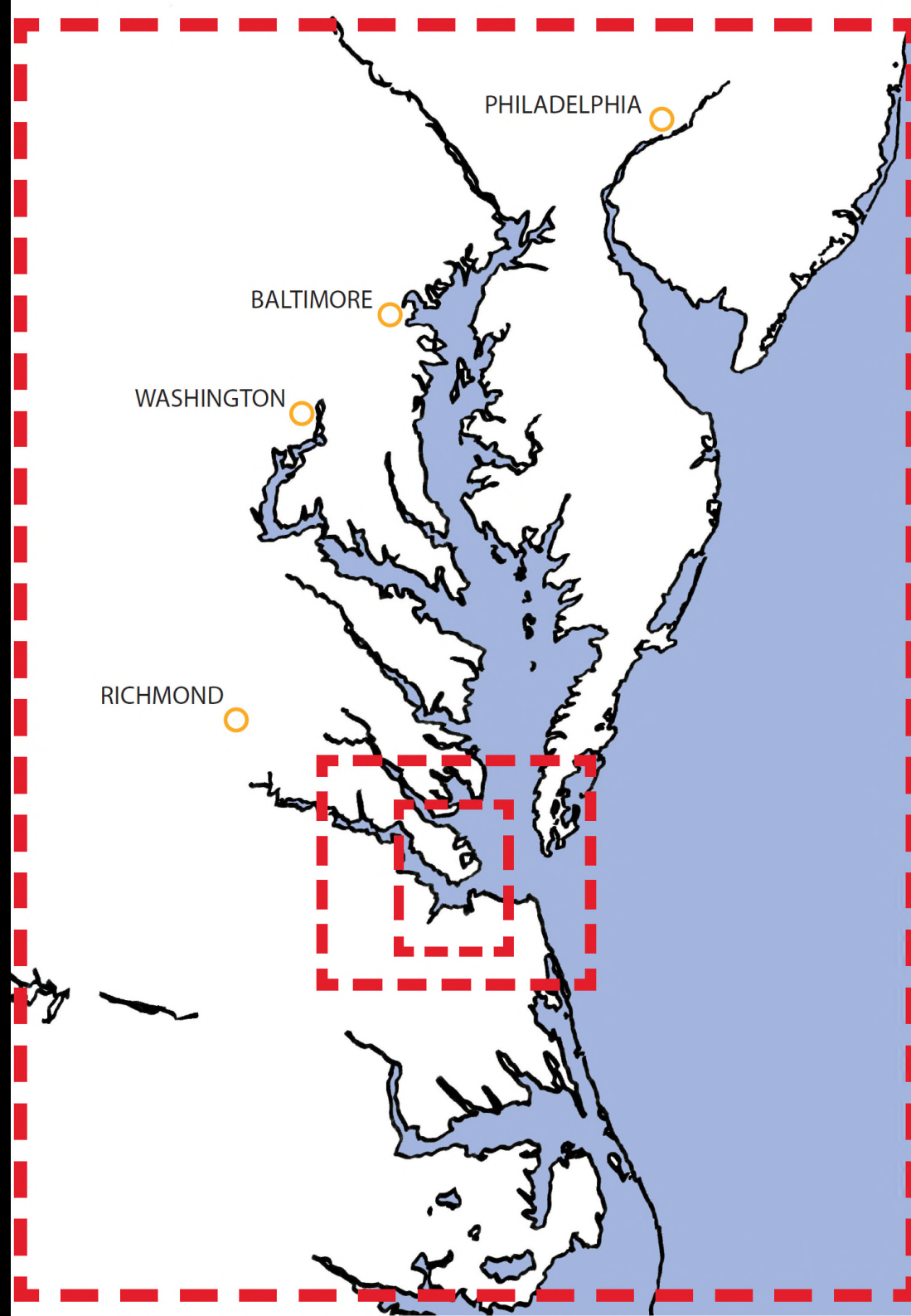
HAMPTON ROADS: *A REGION RISING INTO RESILIENCY*

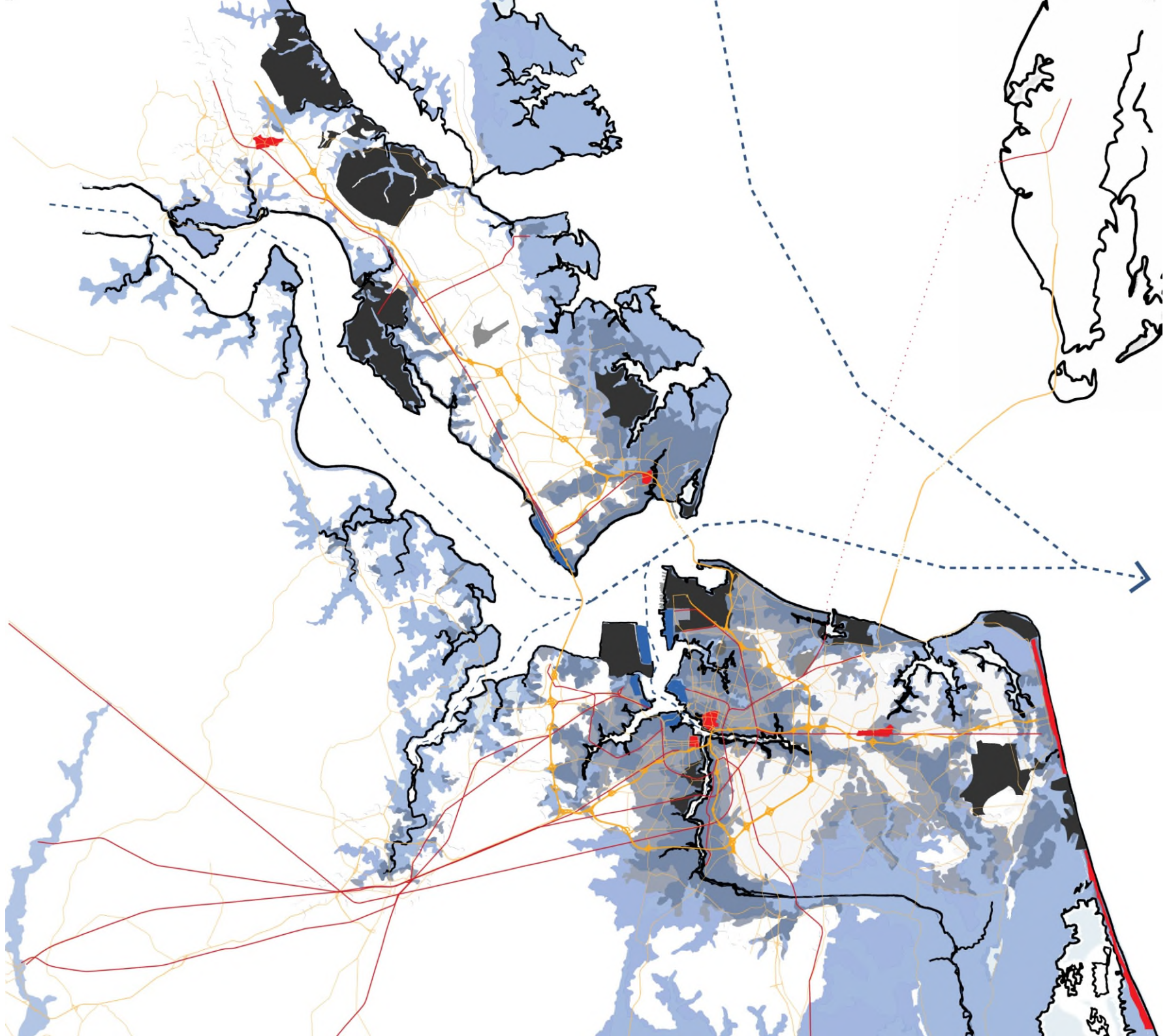


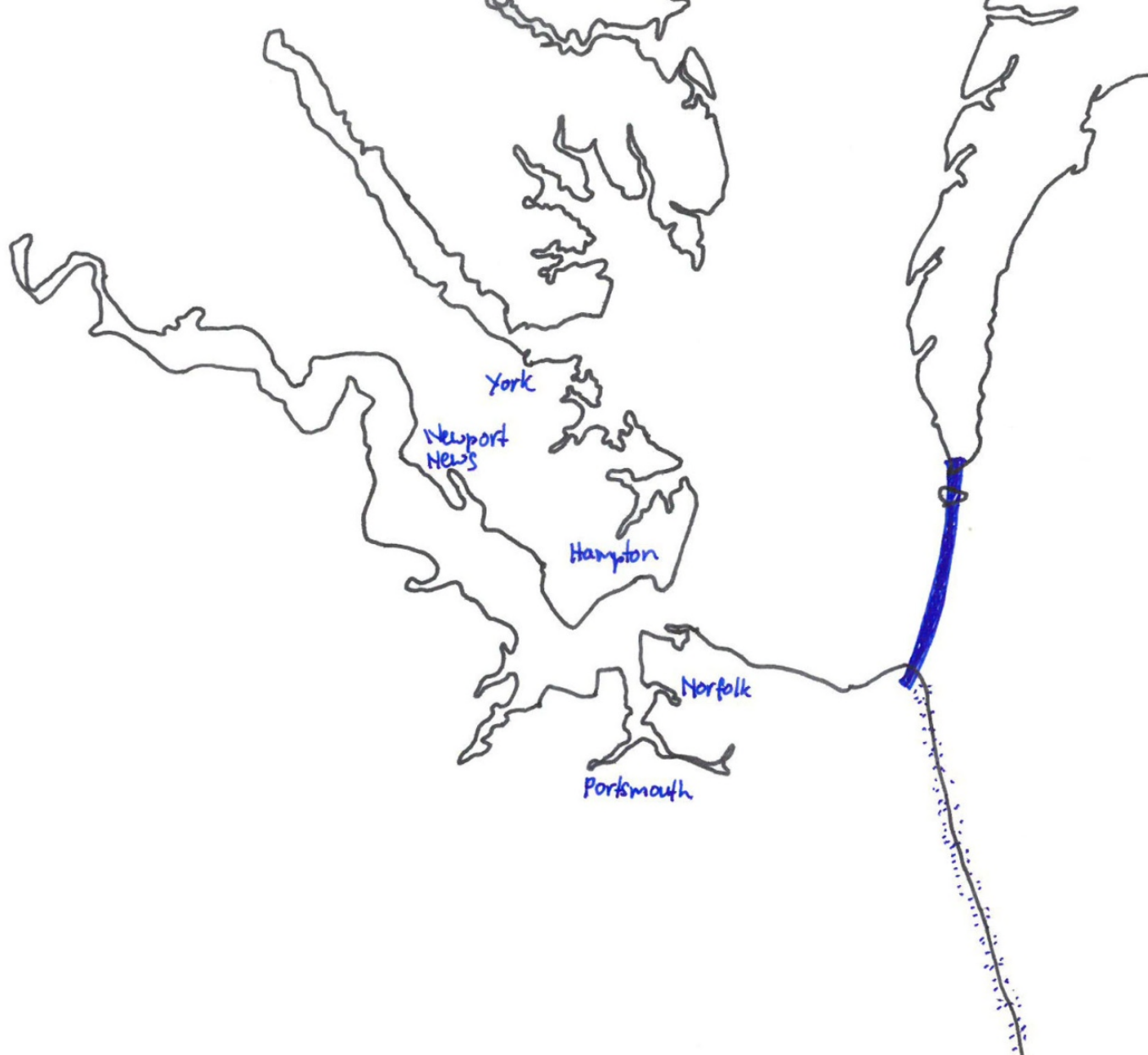
DUTCH DIALOGUES
Virginia: Life at Sea Level

- Navigable Waterways
- Railroads
- CSX Railroads
- Norfolk Southern Railroads





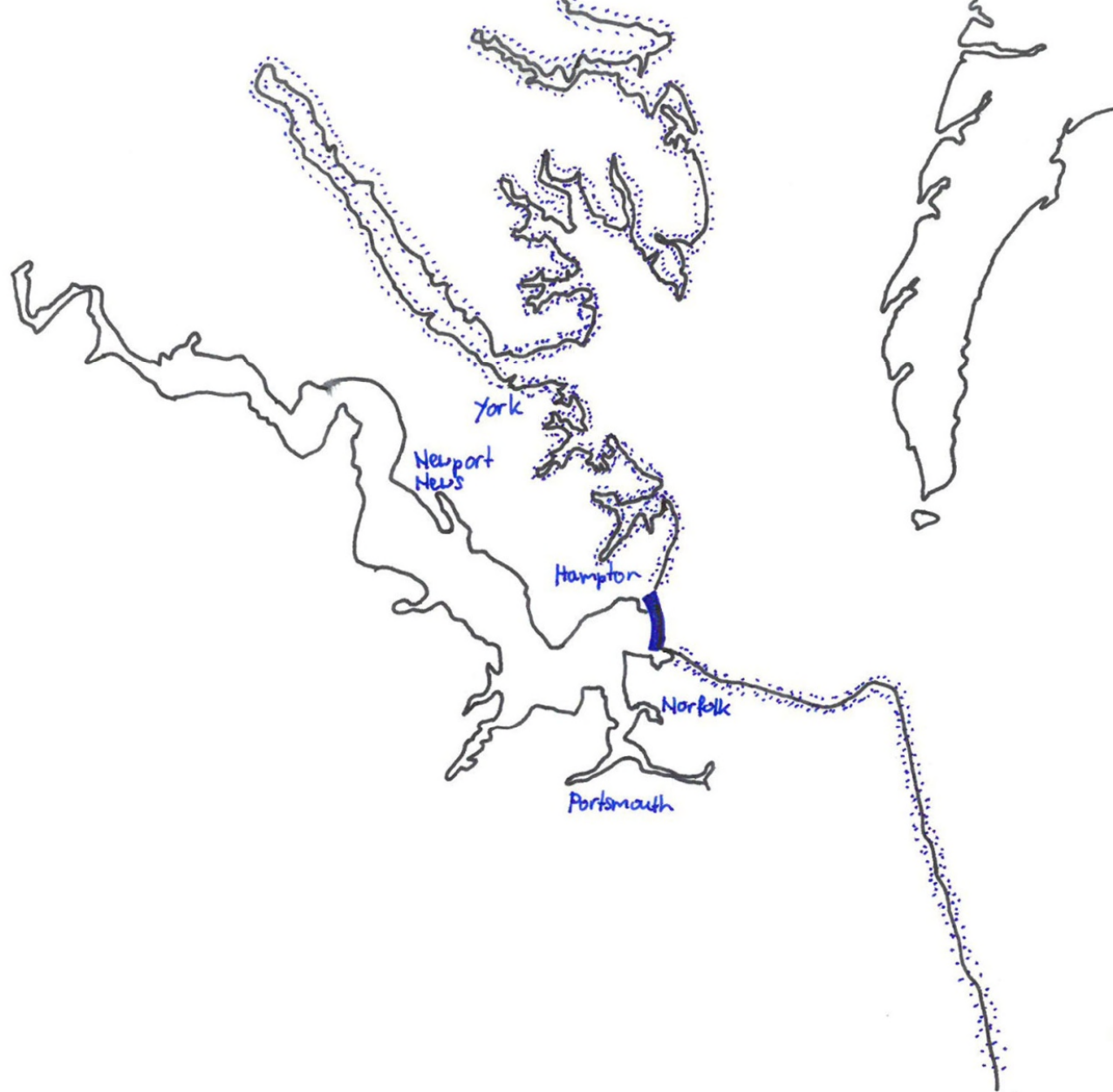




DUTCH *DIALOGUES*

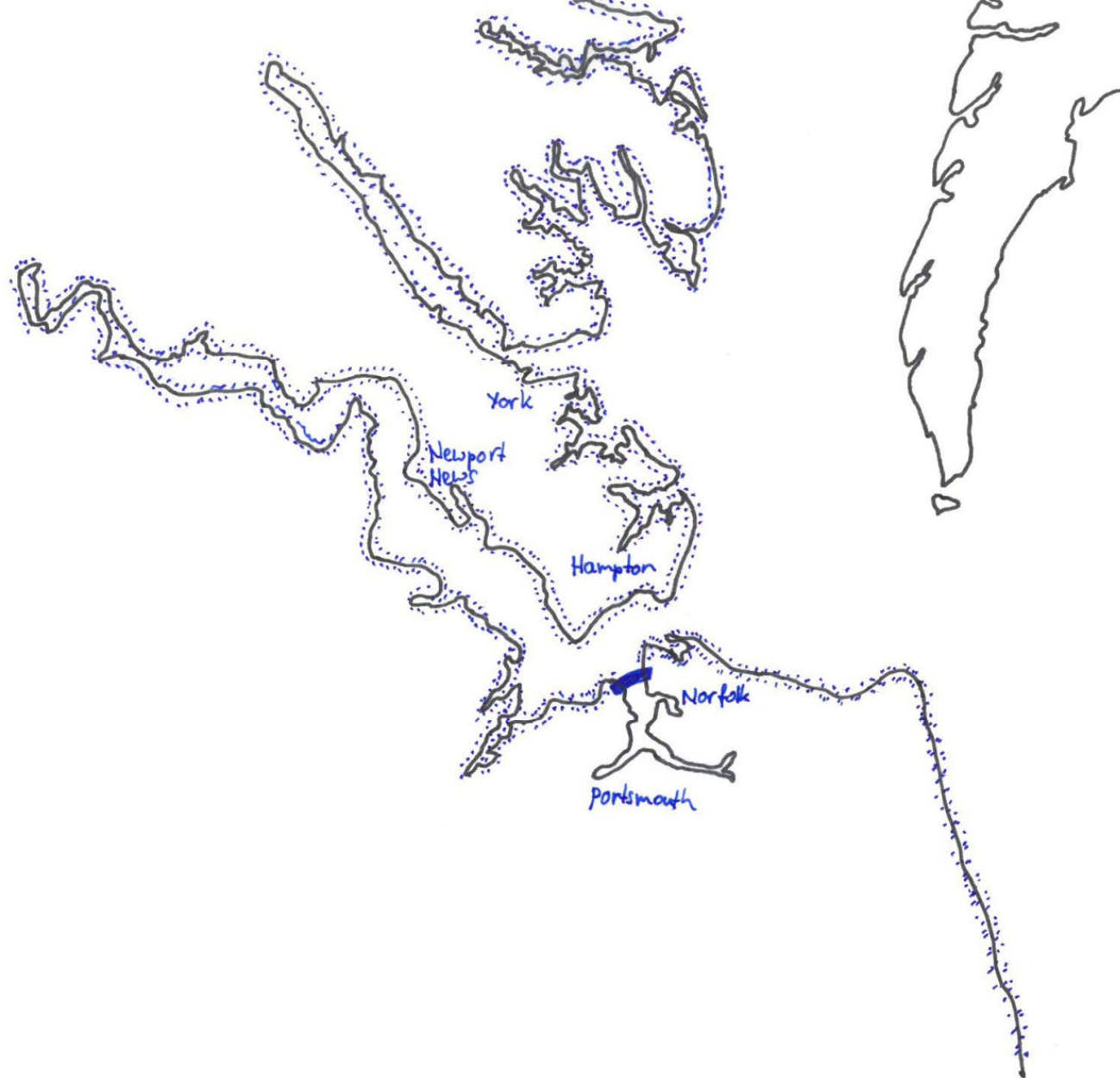
Virginia: Life at Sea Level

Will Storm Surge Barriers Work?



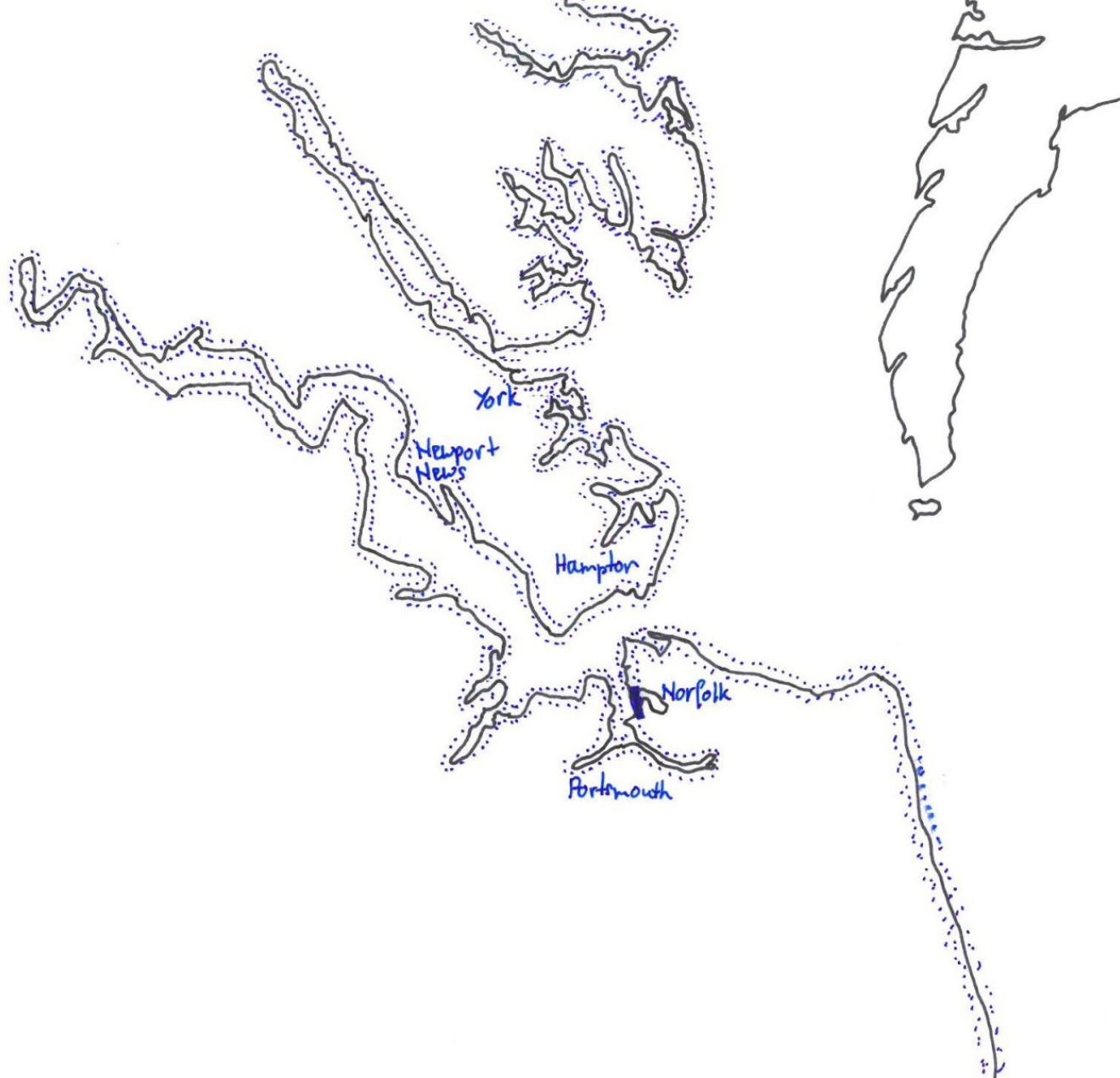
DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Will Storm Surge Barriers Work?



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

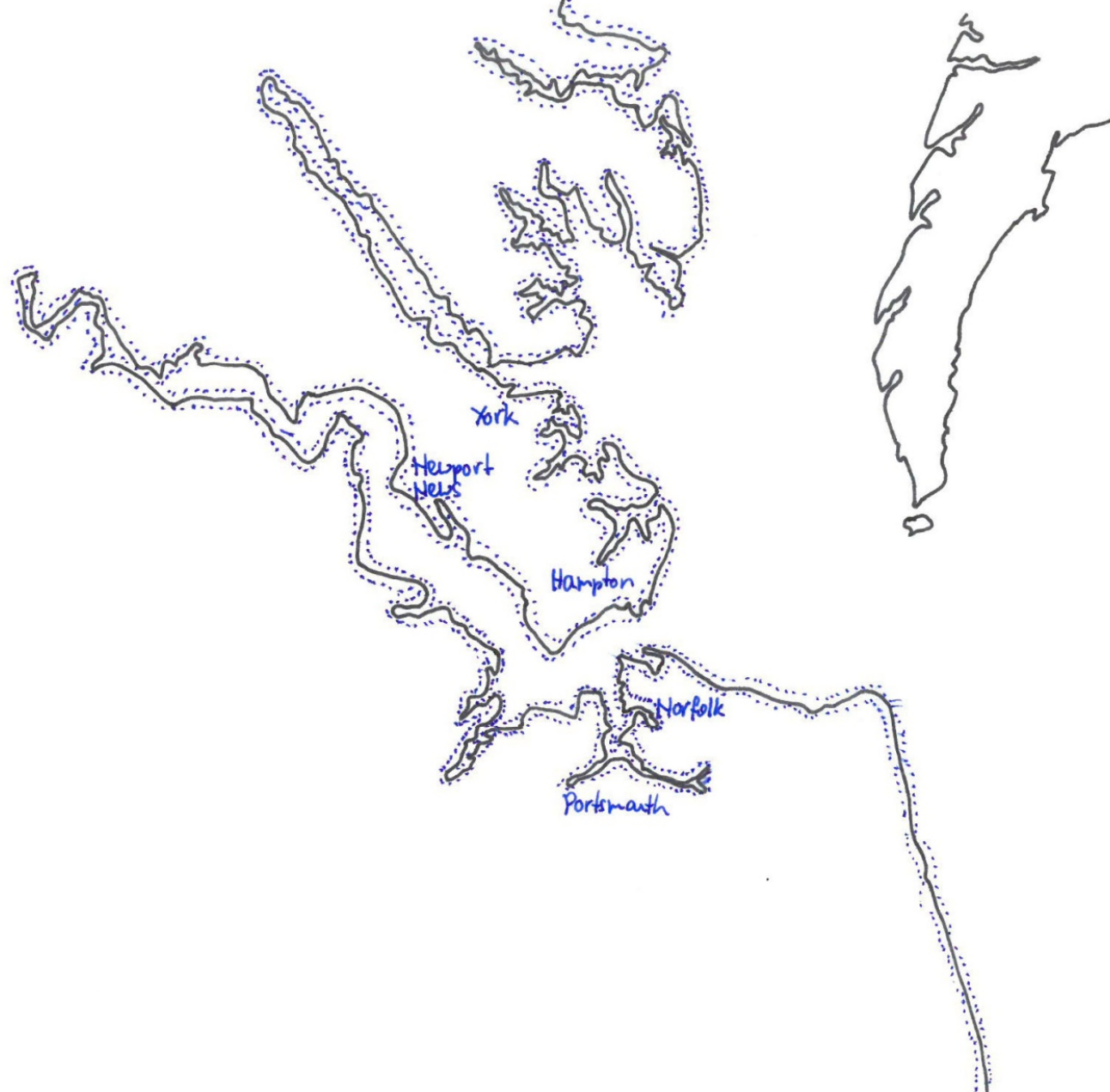
Will Storm Surge Barriers Work?



DUTCH *DIALOGUES*

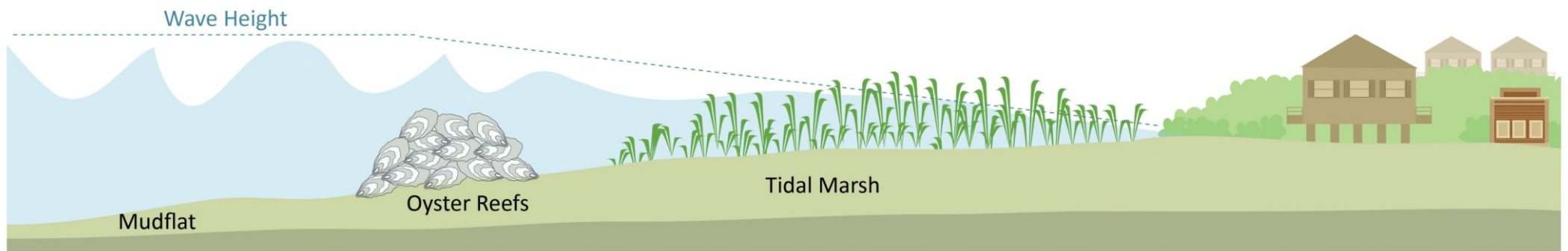
Virginia: Life at Sea Level

Will Storm Surge Barriers Work?



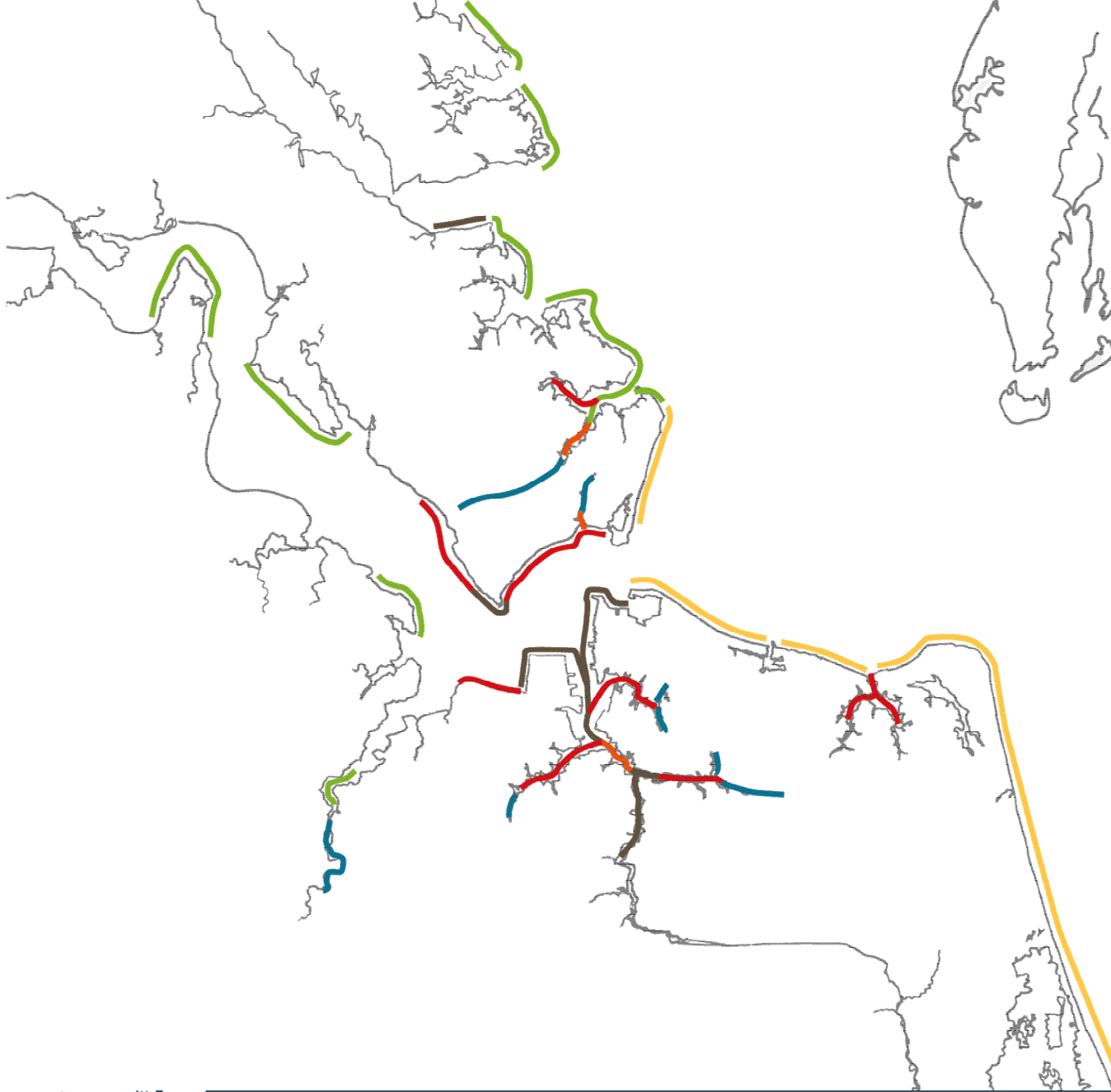
DUTCH DIALOGUES
Virginia: Life at Sea Level

**Adaptive Shorelines
Always a Good Choice**



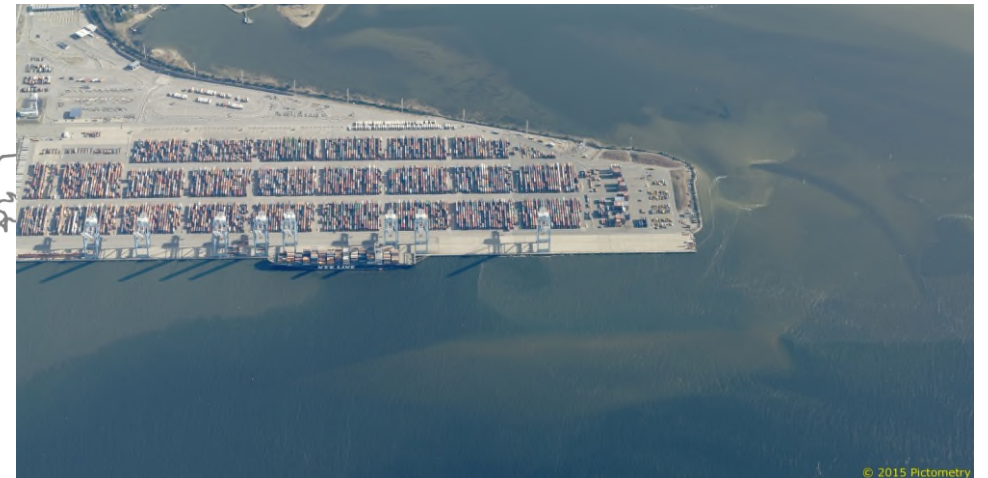
DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Adaptive Shoreline and Adaptive Building



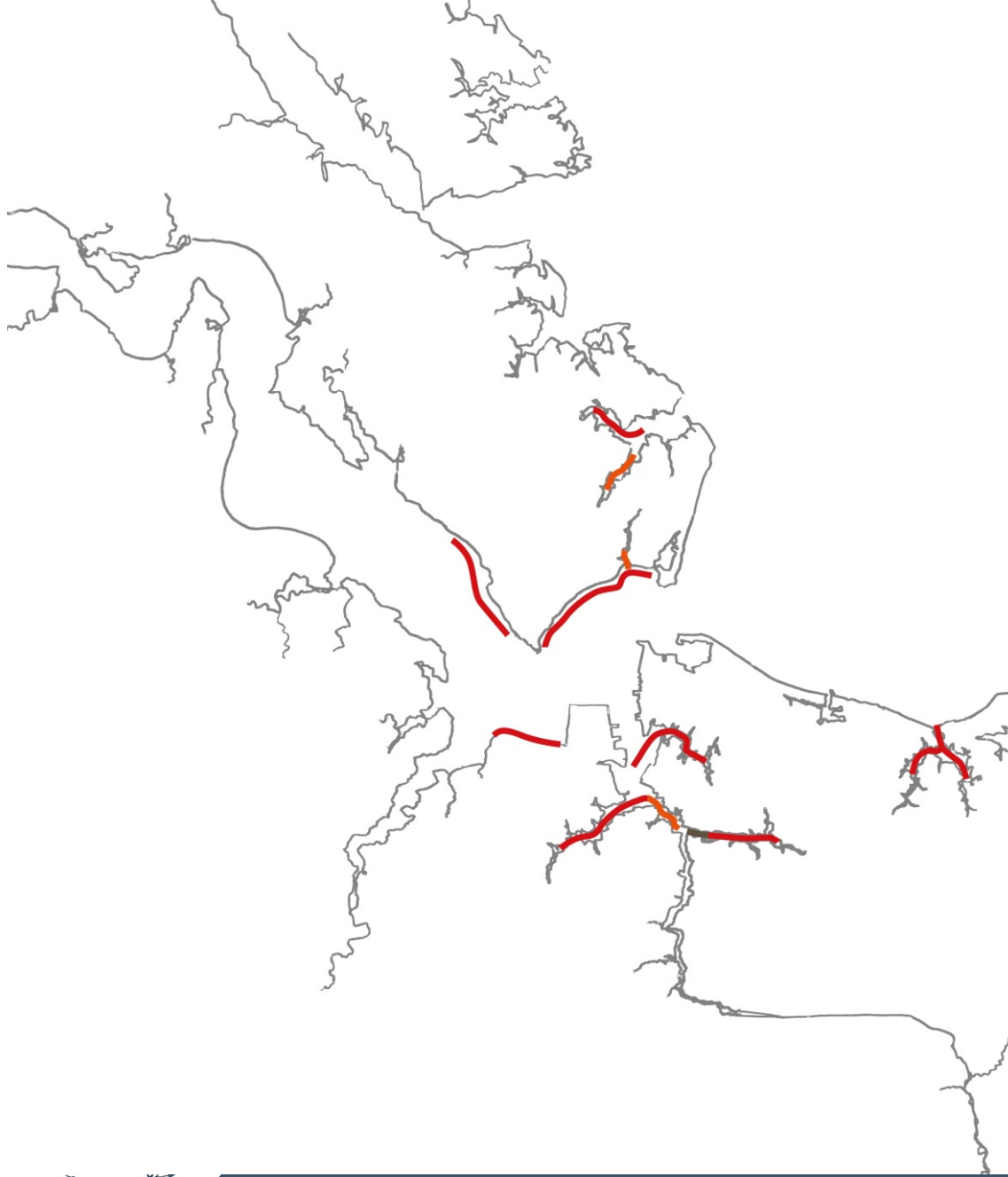
DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Edge Conditions



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Industrial



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Developed



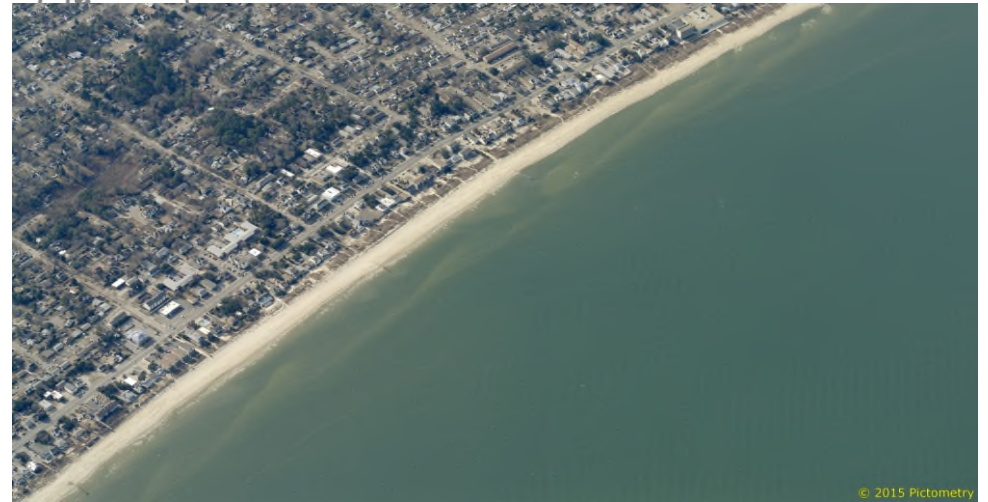
DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Inland



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

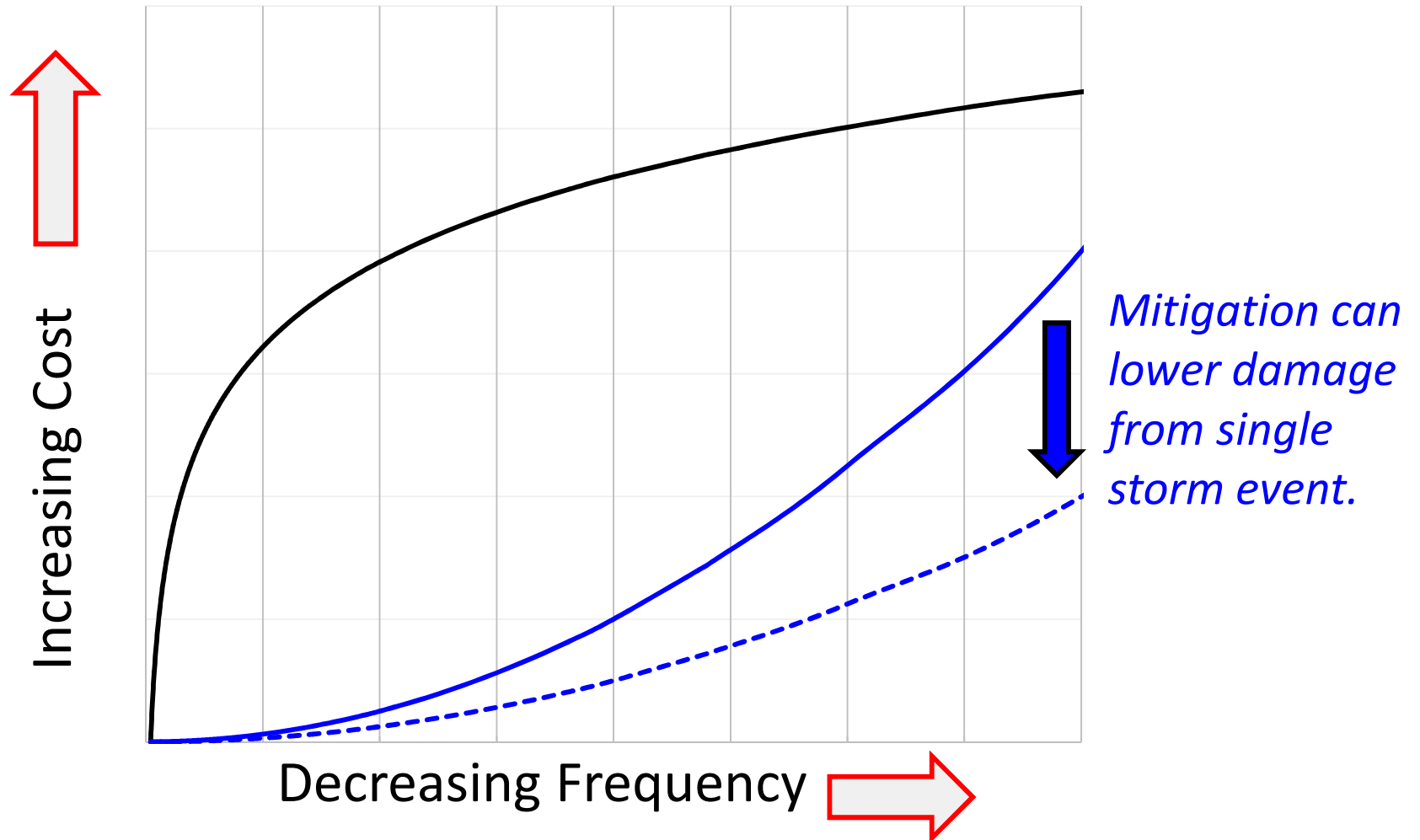
Wetlands



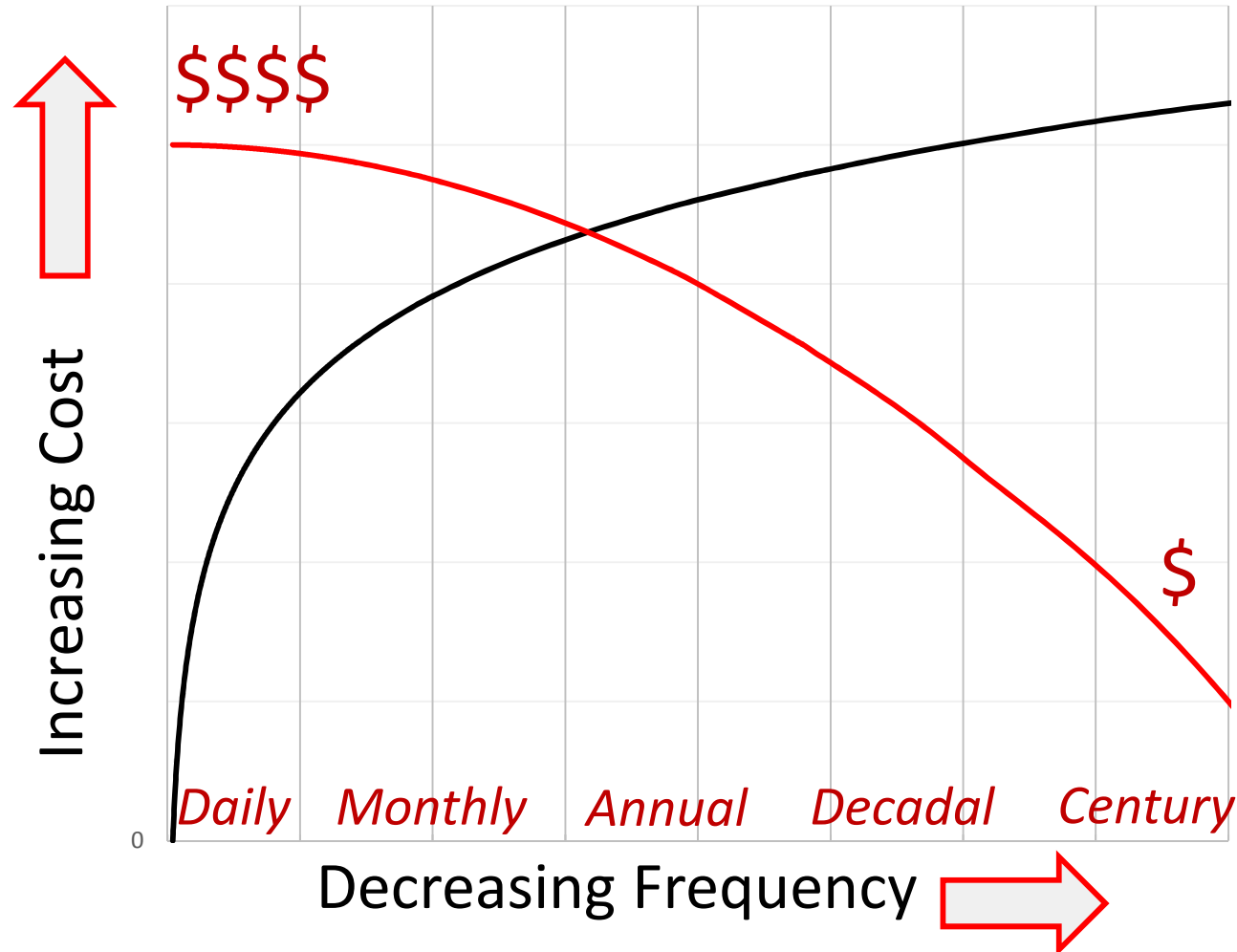
DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Beaches

Effect of Mitigation



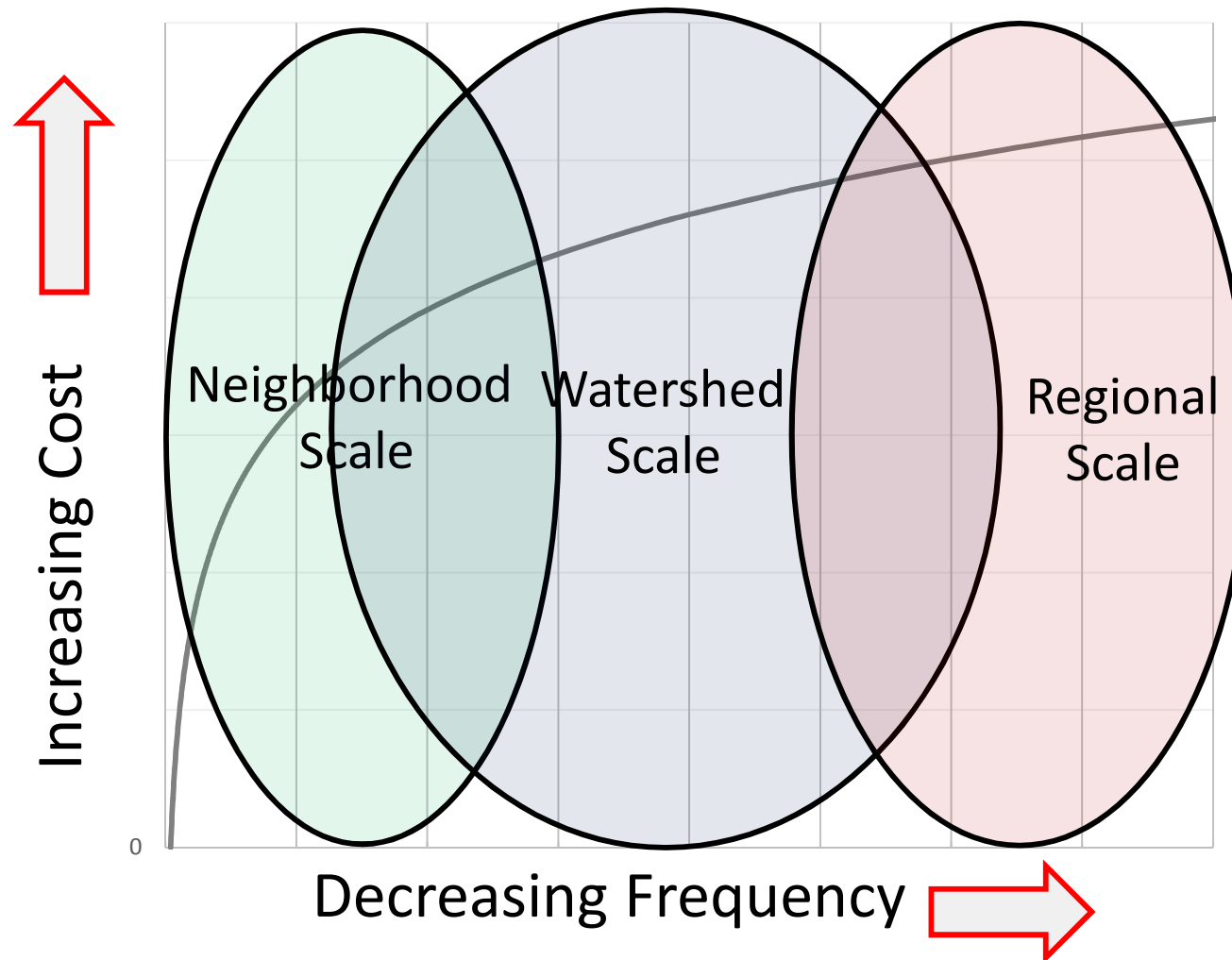
Cumulative Economic Impact



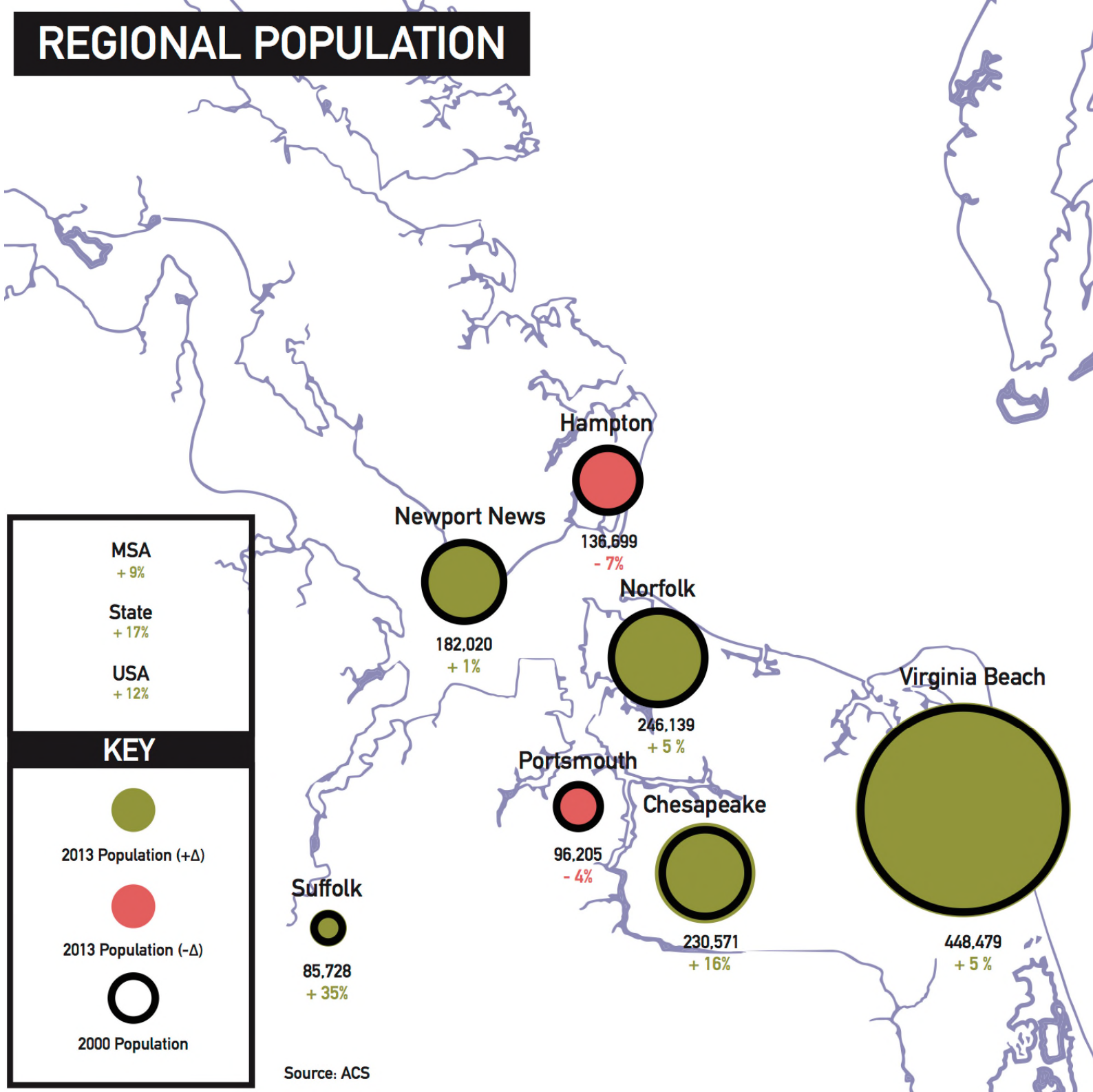
DUTCH *DIALOGUES*

Virginia: Life at Sea Level

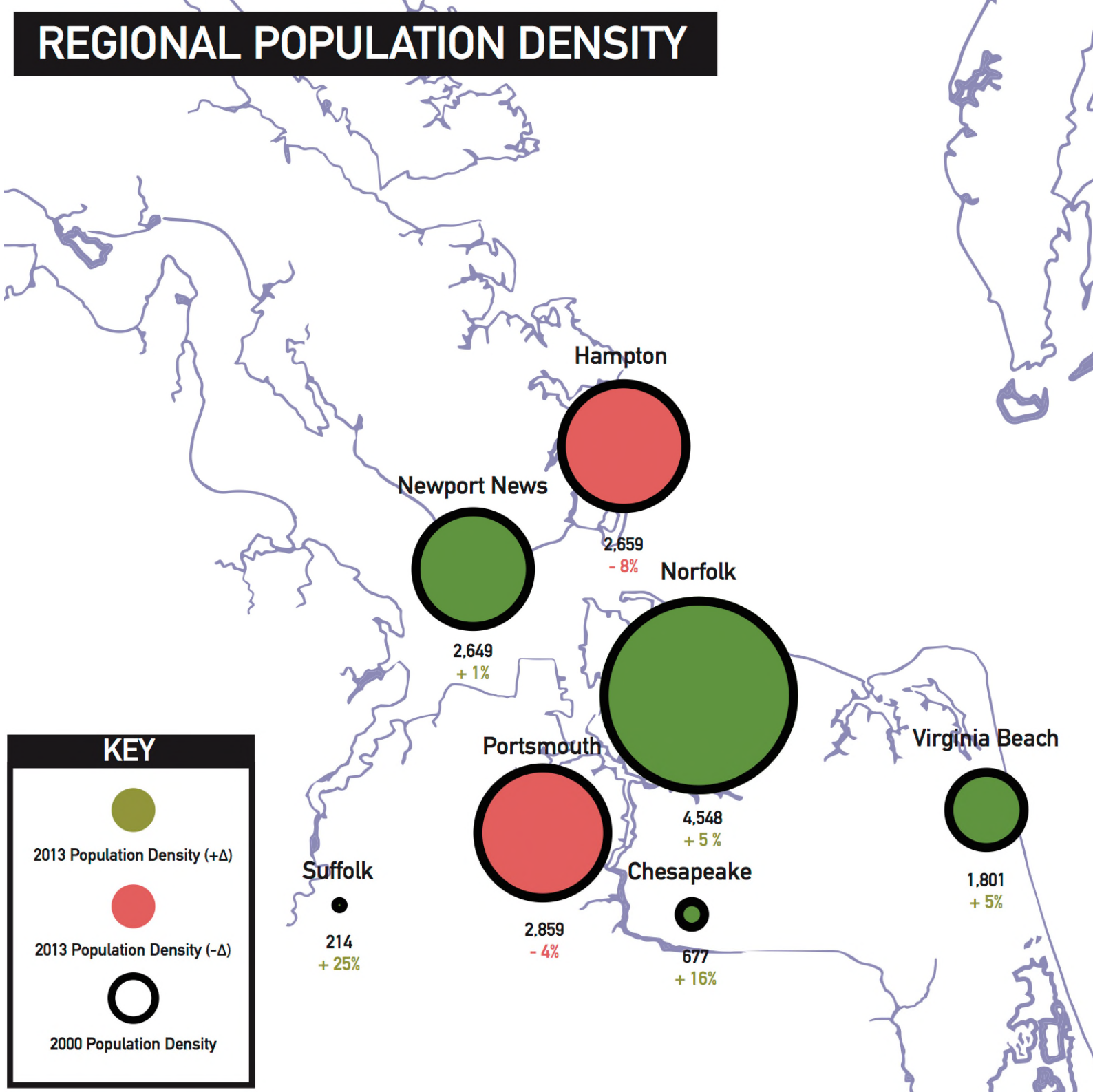
Size of Flood Impact



REGIONAL POPULATION



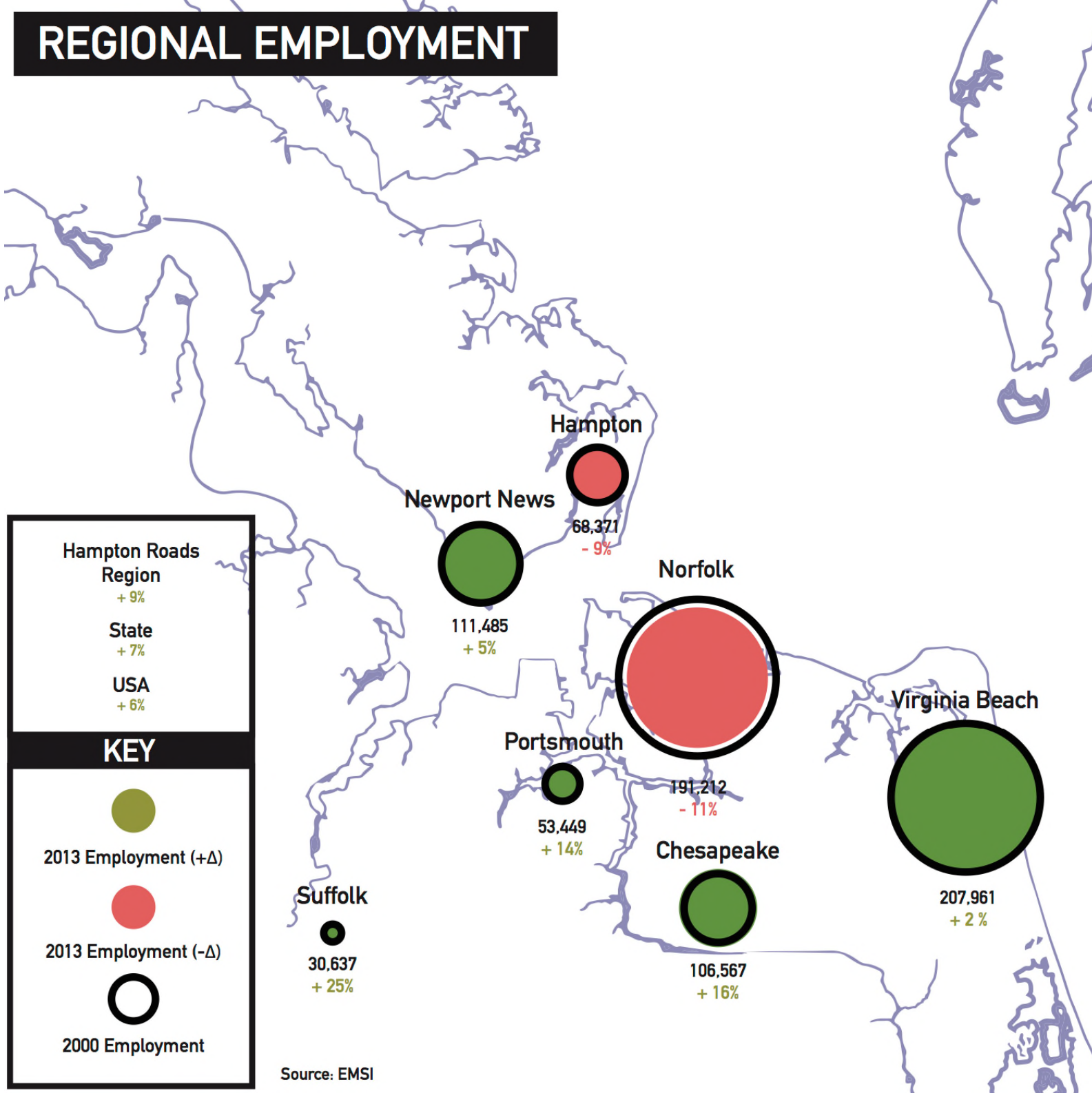
REGIONAL POPULATION DENSITY



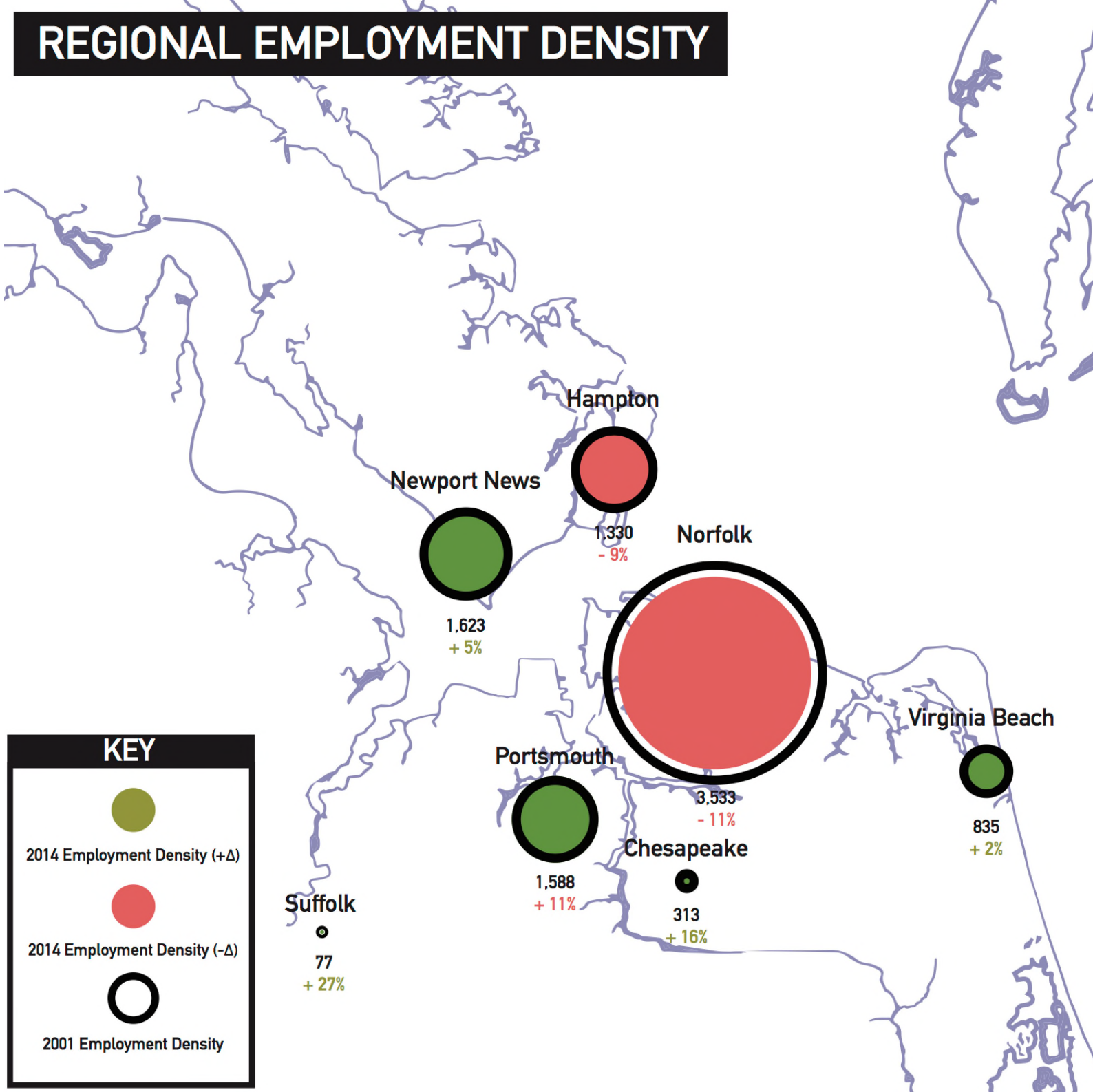
KEY

- 2013 Population Density (+Δ)
- 2013 Population Density (-Δ)
- 2000 Population Density

REGIONAL EMPLOYMENT



REGIONAL EMPLOYMENT DENSITY



Governance – it can be done!

Conditions:

- Collaborate when it makes sense
- With respect to existing initiatives and taking advantage of new opportunities
- With the support of the business community/leaders
- With strong leadership



Considered options

- New legislation to form a political subdivision with a SLR focus
- Regional investment authority for water management + infrastructure
- Business as usual (fragmented approach)
- Federal government steps in, takes over and runs it (Tennessee Valley Authority)



Preferred options

1. Start a SLR compact with frontline cities (city managers) with the support of business alliance (CEO roundtable).
2. SLR planning and implementation in HR demands regional leadership and resources. PDC leads the regional effort, using statutory authority.



Lessons learned

guiding principles

**1 Start from a larger perspective,
in scale as well in time**

**You need a regional approach
and a dot at the horizon
The trick is to connect long term
perspective and concrete short
term measures**

2 Dare to be innovative

3 Work with the system, not against it.

**Analyze the system,
when you understand how it works
you can work along with it**

**4 Don't accept solutions
that only work**

**Strive for solutions that
both work and add value**

5 Be careful with water

Retain, store, drain

6 Use drawing as Esperanto between different disciplines

**Speeding up the process,
Focussing the debate**

7 Dare to think outside the box

When you dare to leave the box you will discover brand new perspectives



NORFOLK: *THRIVING WITH WATER*



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Tidewater Drive District



DUTCH DIALOGUES
Virginia: Life at Sea Level

Harbor Park



DUTCH DIALOGUES
Virginia: Life at Sea Level

South of Brambleton



DUTCH DIALOGUES
Virginia: Life at Sea Level

Chesterfield Heights



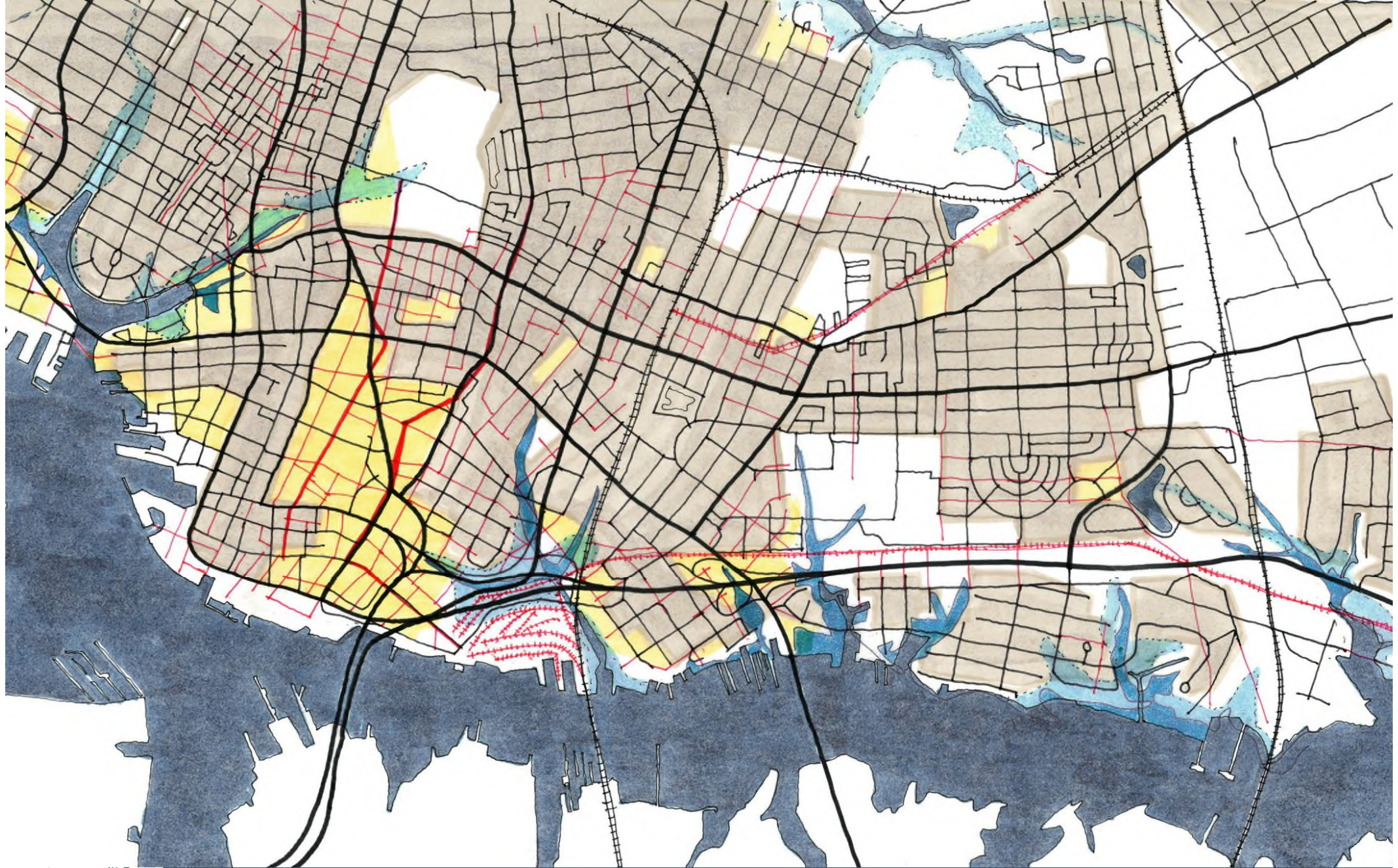
DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Tidewater Drive District Goals



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Norfolk 1890's



DUTCH DIALOGUES
Virginia: Life at Sea Level

Historic Pattern & Density



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

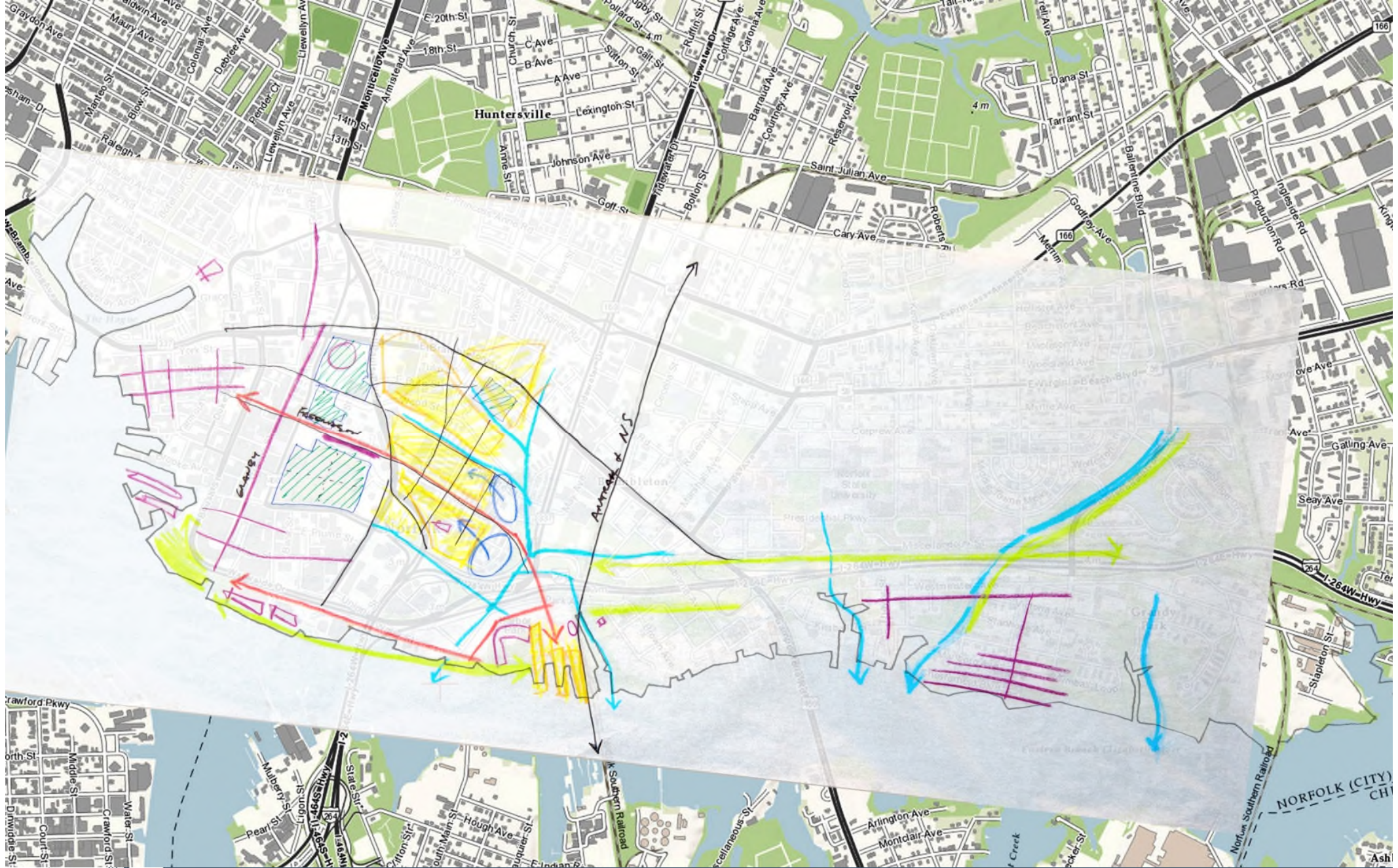
Existing Topography



High + Low Ground with Existing Sea Wall

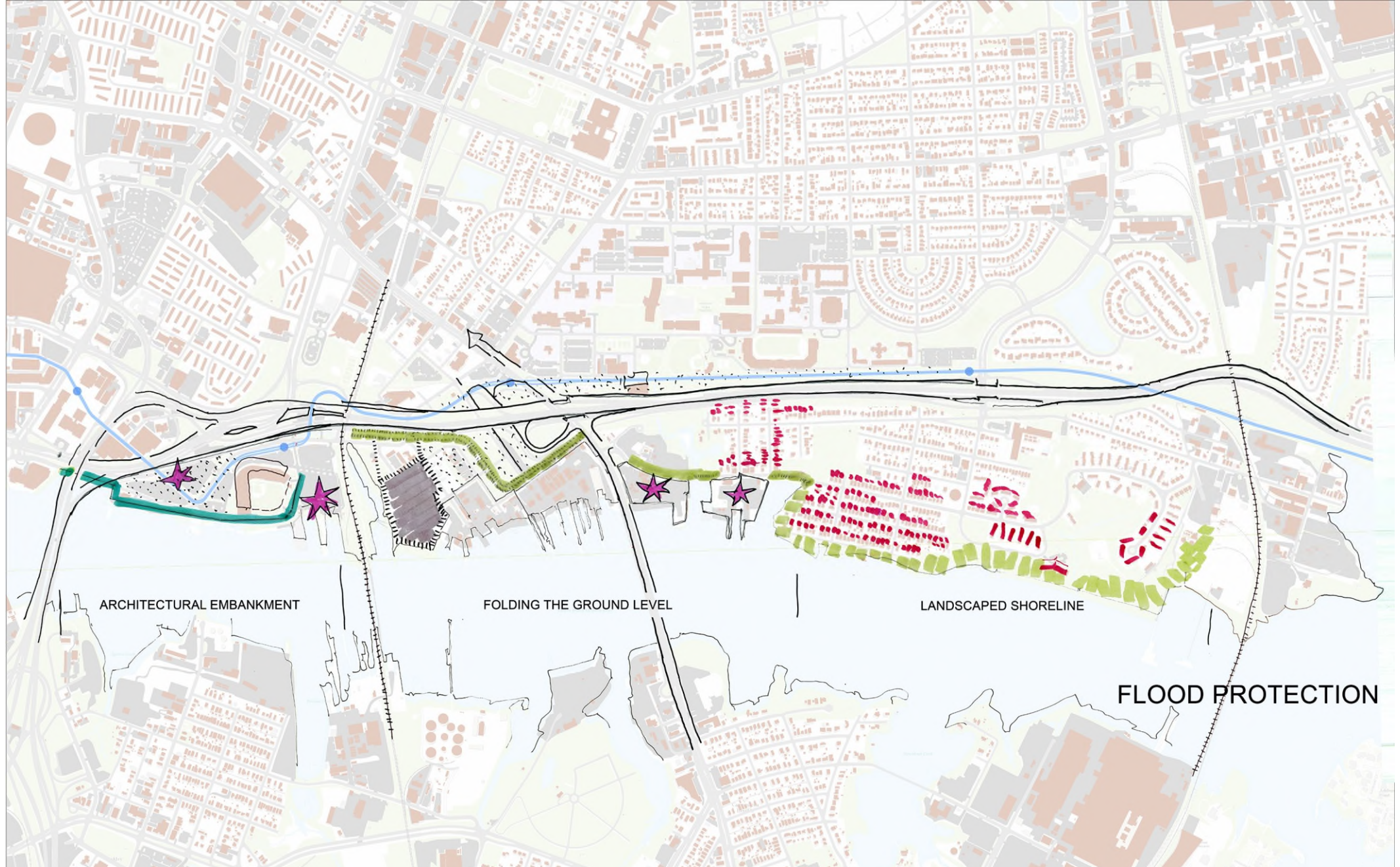
DUTCH DIALOGUES
Virginia: Life at Sea Level





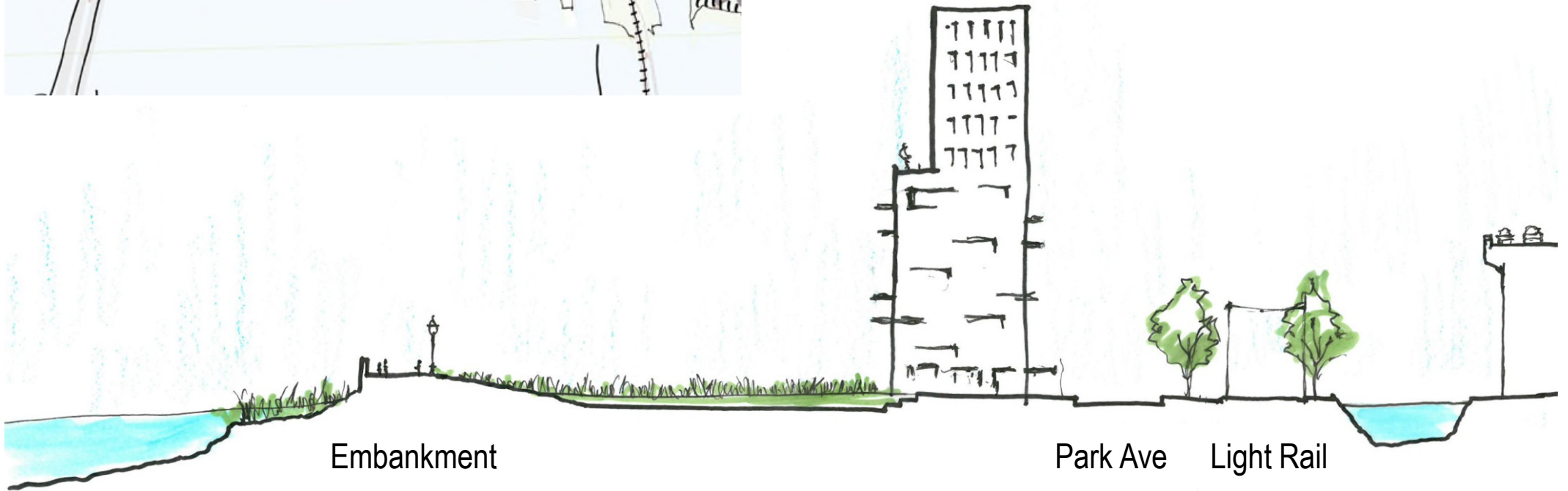
DUTCH DIALOGUES
Virginia: Life at Sea Level

Conceptual Framework



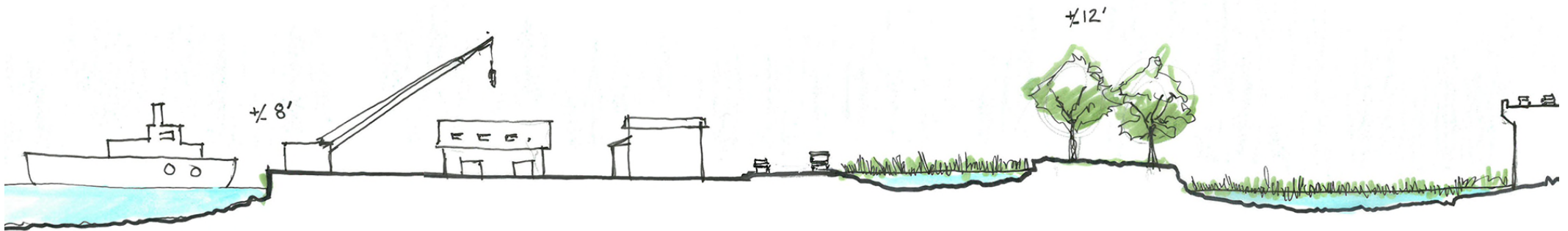
DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Flood Protection



DUTCH DIALOGUES
Virginia: Life at Sea Level

Architectural Embankment



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Folding Ground Level



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Landscaped Shoreline

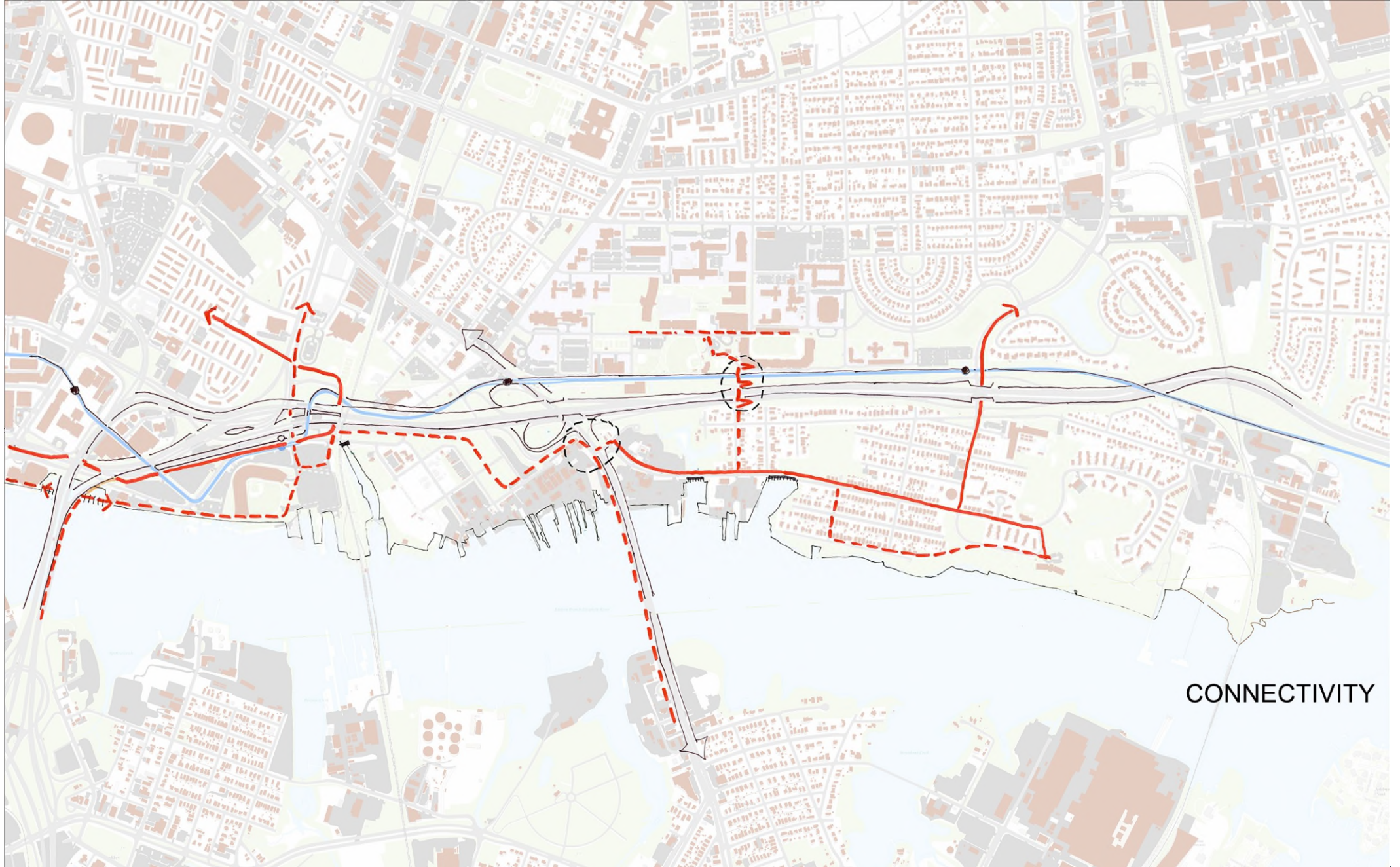


WATER STORAGE



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Water Storage

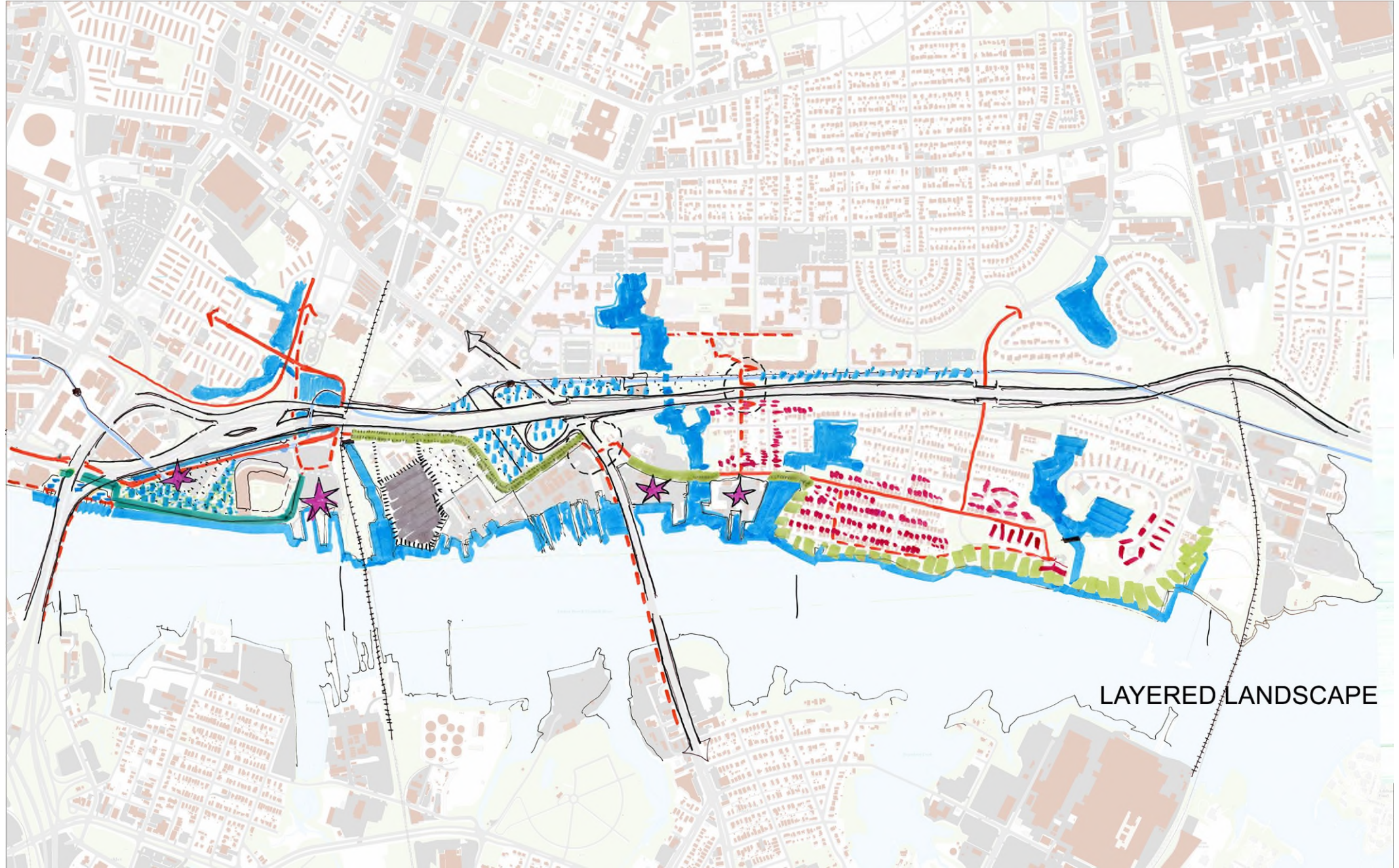


CONNECTIVITY



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Connectivity

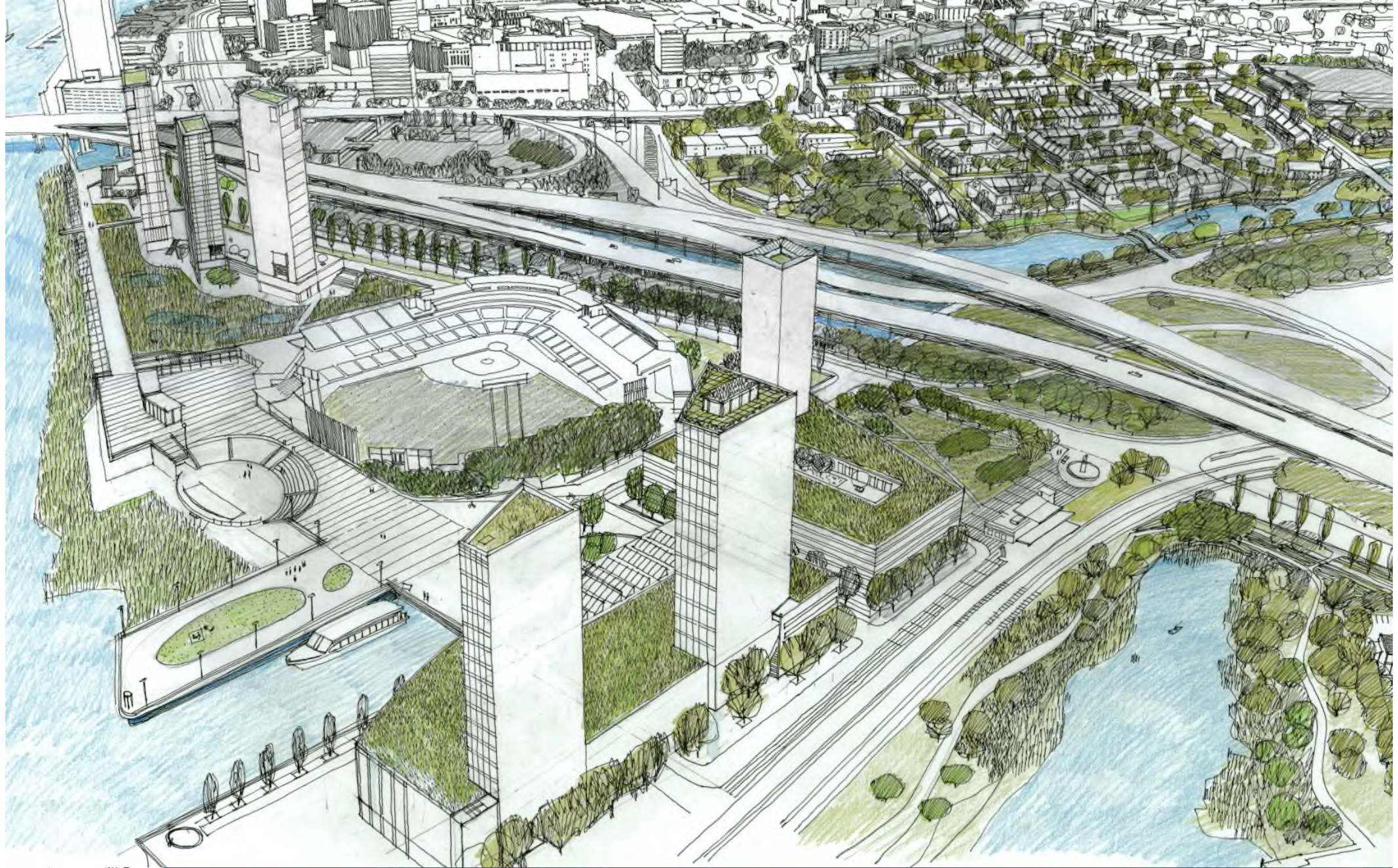


LAYERED LANDSCAPE



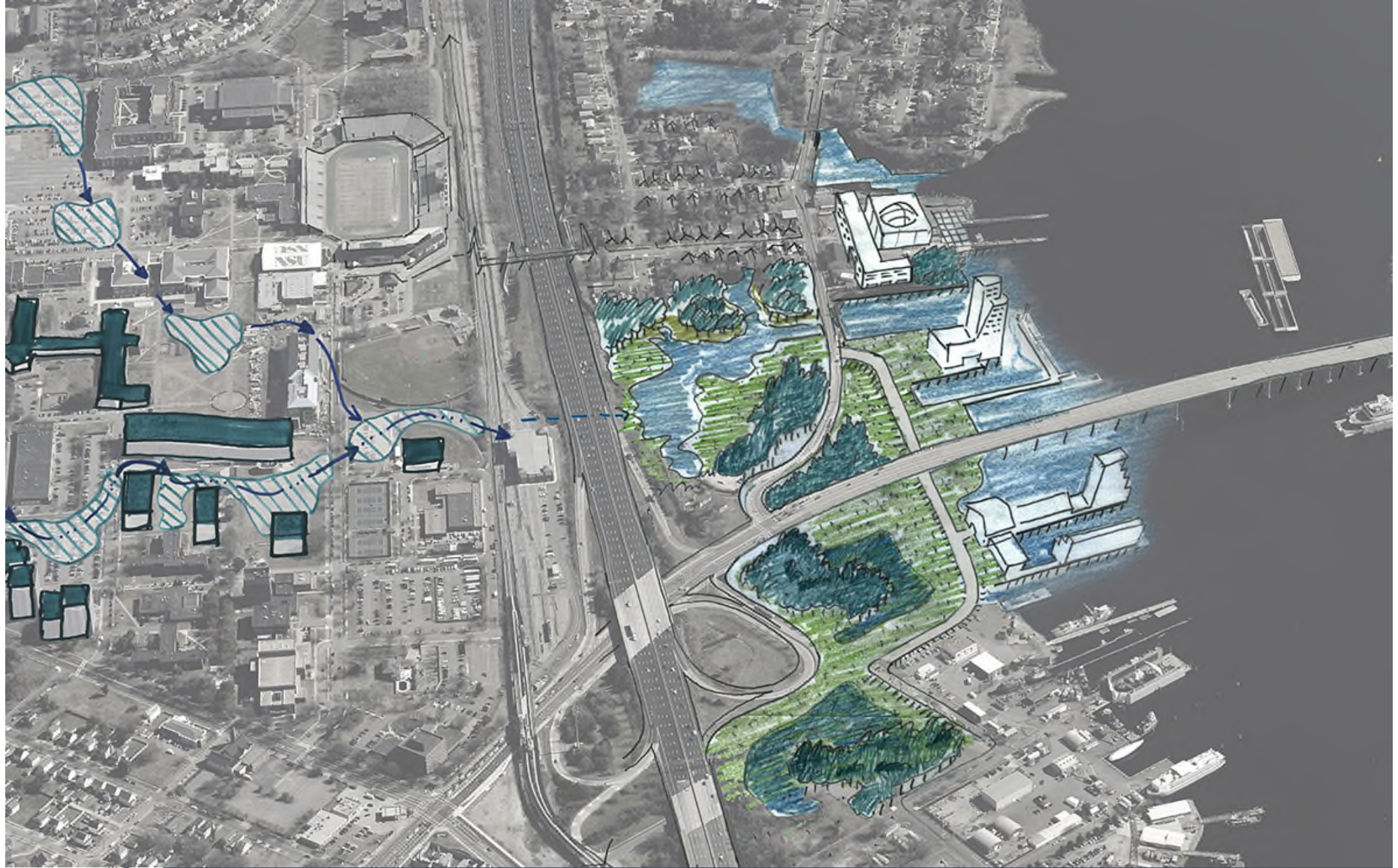
DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Layered Landscape



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Harbor Park



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

South of Brambleton



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Chesterfield Heights



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Stormwater Flooding



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Storm Surge Flooding



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Disconnect and Re:Store



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Disconnect...



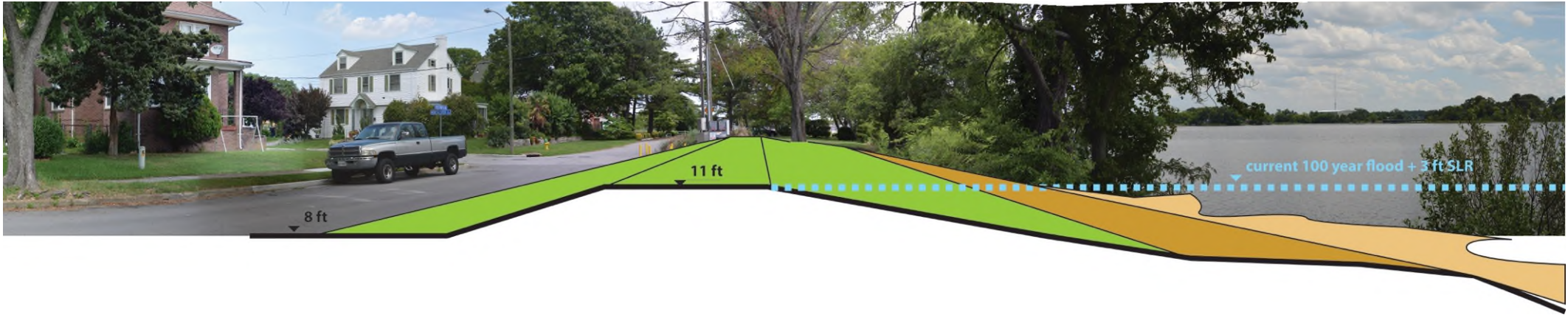
DUTCH *DIALOGUES*
Virginia: Life at Sea Level

...and Re:Store



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Protect and Re:Shore



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Protect...

Graded Bank

Backfill & Planted
Marsh

25 ft

3 Gapped Sills + 1
Marsh Toe



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

...and Re:Shore



Green Streets



Green Roofs



Green Retention Landscape



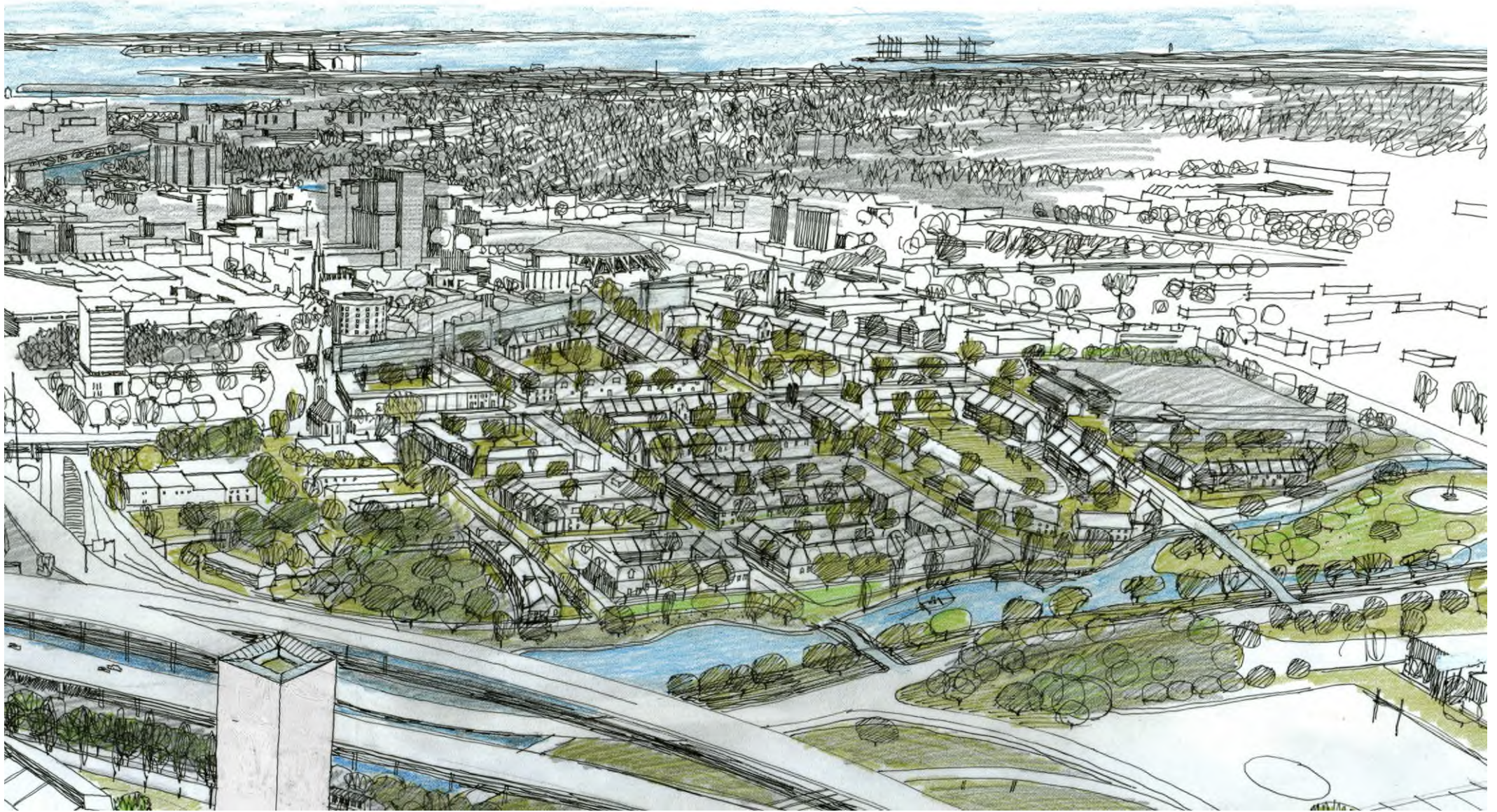
DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Store (and more)



DUTCH DIALOGUES
Virginia: Life at Sea Level

Rising into Resilience



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

St. Paul's Quadrant



Historical Shorelines



DUTCH DIALOGUES
Virginia: Life at Sea Level



DUTCH DIALOGUES
Virginia: Life at Sea Level



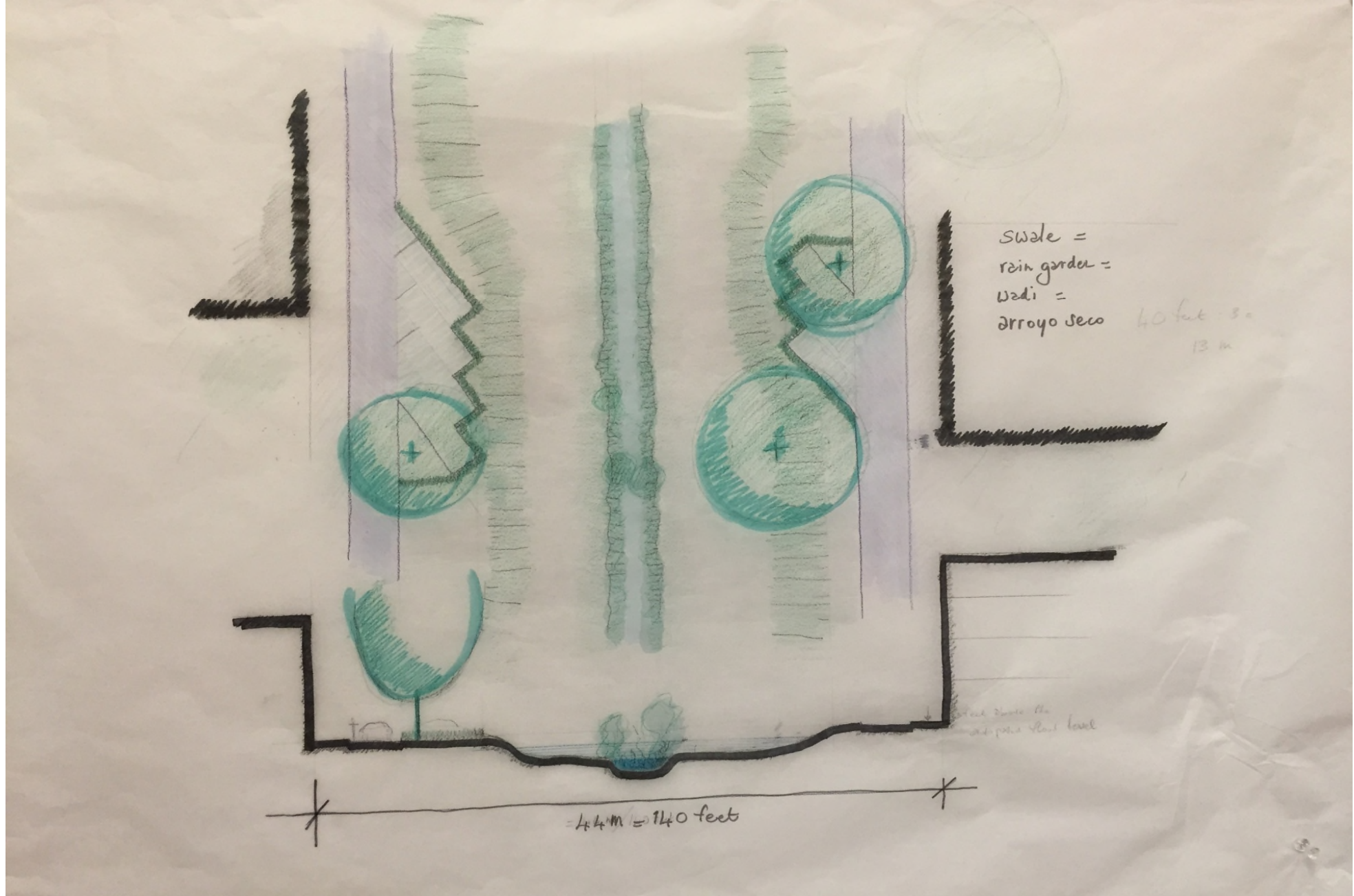
DUTCH *DIALOGUES*
Virginia: Life at Sea Level



DUTCH *DIALOGUES*
Virginia: Life at Sea Level



DUTCH *DIALOGUES*
Virginia: Life at Sea Level



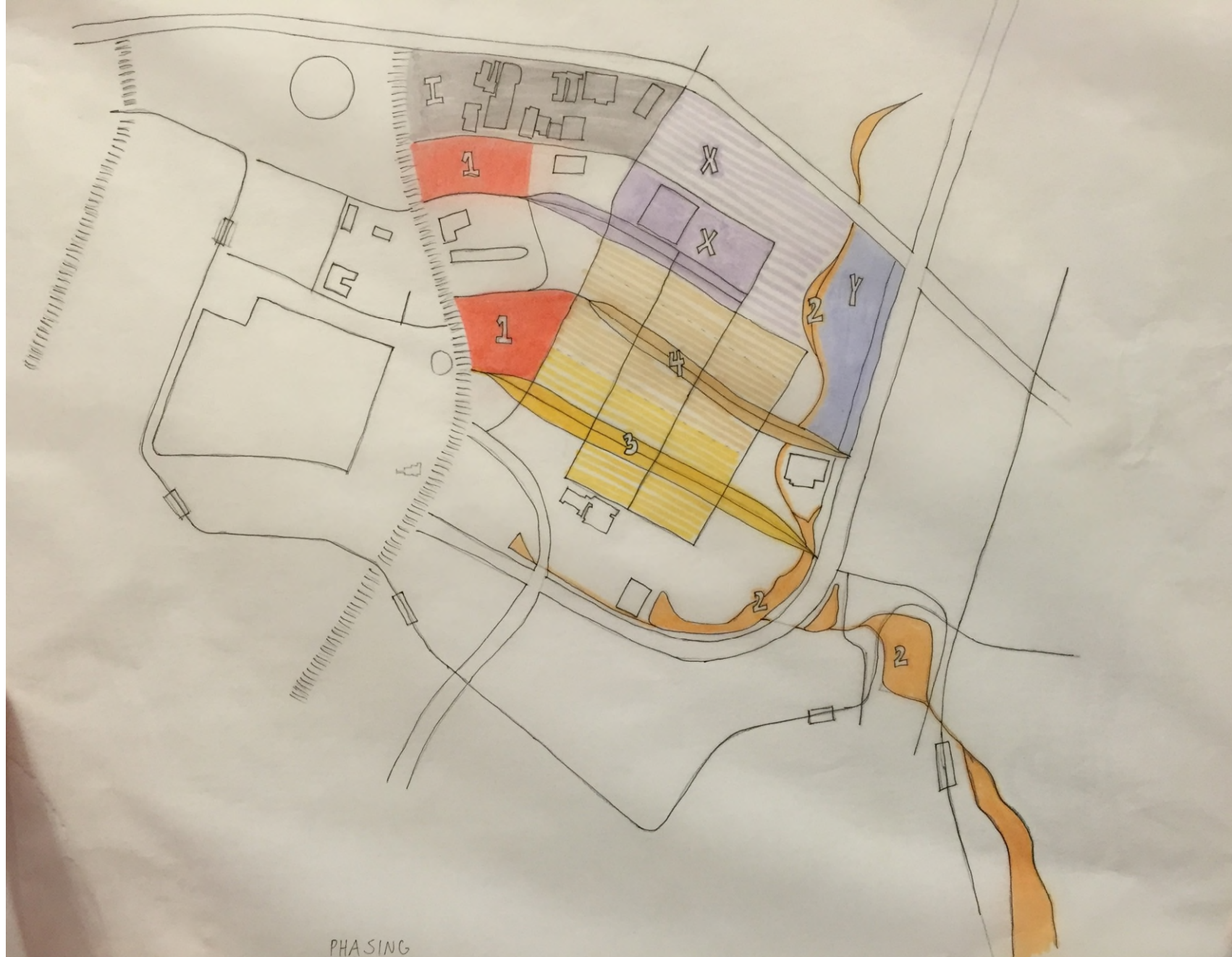
DUTCH DIALOGUES
Virginia: Life at Sea Level



DUTCH *DIALOGUES*
Virginia: Life at Sea Level



DUTCH *DIALOGUES*
Virginia: Life at Sea Level



DUTCH *DIALOGUES*
Virginia: Life at Sea Level

Phasing

